Assembly and Operating Manual
EGL
2-finger parallel gripper
Firmware 2.x

Original Betriebsanleitung

Hand in hand for tomorrow

Imprint

Technical changes:
We reserve the right to make alterations for the purpose of technical improvement.

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Dear Customer,

Thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

Customer Management
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cmg@de.schunk.com

Please read the operating manual in full and keep it close to the product.

Table of Contents

1 General

1.1 About this manual

This manual contains important information for a safe and appropriate use of the product.

This manual is an integral part of the product and must be kept accessible for the personnel at all times.

Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.

In addition to these instructions, the documents listed under ▸ 1.1.4 [🗋 7] are applicable.

NOTE: The illustrations in this manual are intended to provide a basic understanding and may deviate from the actual version.

1.1.1 Presentation of Warning Labels

To make risks clear, the following signal words and symbols are used for safety notes.

⚠ DANGER

Dangers for persons!

Non-observance will inevitably cause irreversible injury or death.

⚠ WARNING

Dangers for persons!

Non-observance can lead to irreversible injury and even death.

⚠ CAUTION

Dangers for persons!

Non-observance can cause minor injuries.

CAUTION

Material damage!

Information about avoiding material damage.

1.1.2 Definition of Terms

The term "product" replaces the product name on the title page in this manual.

1.1.3 Symbol definition

The following symbols are used in this manual:

■ Prerequisite for an action

1. Action 1
2. Action 2
   ⇨ Intermediate results

⇨ Final results

▸ 1.1.3 [🗋 6]: chapter number and [page number] in hyperlinks

1.1.4 Applicable documents

- General terms of business *
- Catalog data sheet of the purchased product *
- Assembly and operating manuals of the accessories *

The documents labeled with an asterisk (*) can be downloaded from **schunk.com/downloads**.

1.2 Warranty

If the product is used as intended, the warranty is valid for 24 months from the ex-works delivery date under the following conditions:

- Observe the specified maintenance and lubrication intervals
- Observe the ambient conditions and operating conditions

Parts touching the workpiece and wear parts are not included in the warranty.

1.3 Scope of delivery

The scope of delivery includes

- 2-finger parallel gripper EGL in the version ordered, firmware 2.x
- Safety information (product-specific instructions available online)
- USB cable mini A
- USB cable micro B
- 2 x centering sleeve Ø 10 x 6.65
- 4 x centering sleeve Ø 8 x 5.35

Scope of the commissioning software:

- "SCHUNK Motion Tool (MTS)" configuration and commissioning tool
- "SCHUNK Motion Tool (MTS)" software manual
- "SCHUNK Motion Protocol (SMP)" software manual
- "SCHUNK Drive Protocol (SDP)" software manual

- Firmware manager
- Assembly and Operating Manual
- USB driver

1.4 Accessories

The following accessories, which must be ordered separately, are required for the product:

- Power cable
- Data cable
  - PROFIBUS or CAN bus
- Termination resistor
  - PROFIBUS or CAN bus

A wide range of accessories are available for this product

For information regarding which accessory articles can be used with the corresponding product variants, see catalog data sheet.

2 Basic safety notes

2.1 Intended use

The product is designed exclusively for gripping and temporarily holding workpieces or objects.

- The product may only be used within the scope of its technical data, ▶ 3 [🗋 20].
- The product is intended for installation in a machine/ automated system. The applicable guidelines for the machine/ automated system must be observed and complied with.
- The product is intended for industrial and industry-oriented use. Its use outside enclosed spaces is only permitted if suitable protective measures are taken against outdoor exposure. The product is not suitable for use in salty air.
- The product can be used within the permissible load limits and technical data for holding workpieces during simple machining operations, but is not a clamping device according to EN 1550:1997+A1:2008.
- Appropriate use of the product includes compliance with all instructions in this manual.
- Any utilization that exceeds or differs from the appropriate use is regarded as misuse.

2.2 Not intended use

It is not intended use if the product is used, for example, as a pressing tool, stamping tool, lifting gear, guide for tools, cutting tool, clamping device or a drilling tool.

- Any utilization that exceeds or differs from the appropriate use is regarded as misuse.

2.3 Constructional changes

Implementation of structural changes

Modifications, changes or reworking, e.g. additional threads, holes, or safety devices, can damage the product or impair its functionality or safety.

- Structural changes should only be made with the written approval of SCHUNK.

2.4 Spare parts

Use of unauthorized spare parts

Using unauthorized spare parts can endanger personnel and damage the product or cause it to malfunction.

- Use only original spare parts or spares authorized by SCHUNK.

2.5 Gripper fingers

Requirements of gripper fingers

Accumulated energy can make the product unsafe and risk the danger of serious injuries and considerable material damage.

- Execute the gripper fingers in such a way that the product reaches either the "open" or "closed" position in a de-energized state.
- Only change gripper fingers if no residual energy can be released.
- Make sure that the product and the top jaws are a sufficient size for the application.

2.6 Ambient conditions and operating conditions

Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction to the product's life span.

- Make sure that the product is used only in the context of its defined application parameters, ▸ 3 [🗋 20].
- Make sure that the product is a sufficient size for the application.
- Make sure that the environment is free from splash water and vapors as well as from abrasion or processing dust. Exceptions are products that are designed especially for contaminated environments.

2.6.1 Electromagnetic compatibility

The product conforms to the requirements of the EMC directive EU 2014/30 and satisfies the requirements of the following standards:

Standard	Title
EN 61000-6-2 (2005)	Immunity for industrial environments
EN 61000-6-3 (2011)	Interference emissions in residential, commercial, industrial and light industrial environments
EN 61000-6-4 (2007)	Emission standard for industrial environments

2.6.2 Environmental conditions

Transport and storage requirements

The product in question exceeds the requirements set out in IEC 61131-2:2007 with regard to permitted ambient conditions. The following data applies in cases where the product is transported and stored in its original packaging.

Mechanical ambient conditions Standard: IEC 60721-3-2 (Edition 1. 3. 1997) Title: Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities, Section 2: Transportation. Class 2M2 applies.

Climatic ambient conditions Standard: IEC 60721-3-2 (Edition 1. 3. 1997) Title: Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities, Section 2: Transportation. Class 2K4 applies.

Based on the named standards, the following values apply for the basic ambient conditions.

Ambient condition	Value	Note
Free fall EN 60068-2-32	<= 0.3 m	In transport packaging: 5 g
Temperature EN 60068-2-2	+70°C	Bb test, dry heat, storage
Temperature EN 60068-2-1	-40°C	Ab test, cold, storage
Thermal shock EN 60068-2-14	-40 ... +70°C	Na test, holding time 3 h, 5 cycles
Air pressure IEC 60068-2-13	1140 ... 660 hPa	Corresponds to a height of -1000 ... 3500 m

Operational requirements

The following overview shows the permitted ambient conditions for the product.

Mechanical ambient conditions Standard: IEC 60721-3-2 (Edition 1. 3. 1997) Title: Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities, Section 3: Stationary use at weatherprotected locations. Class 3M3 applies.

Climatic ambient conditions Standard: IEC 60721-3-2 (Edition 1. 3. 1997) Title: Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities, Section 3: Stationary use at weatherprotected locations. Class 3K3 applies.

Based on the named standards, the following values apply for the basic ambient conditions.

Ambient condition	Value	Note
Temperature EN 60068-2-2	+55°C	Air humidity 55%, non-condensing, dry heat, in operation
Temperature EN 60068-2-1	0°C	Cold, storage, in operation
Temperature EN 60068-2-30	+25 ... +55°C	Damp heat, cyclic

The product may only be used in the following locations if additional measures are taken:

- In locations with a high level of ionizing radiation
- In locations with difficult operating conditions, e.g., due to caustic fumes, gases, oils or chemicals
- In facilities requiring special monitoring, e.g., in particularly at-risk areas

The product must also not be used in potentially explosive zones. If the product is subjected to unacceptably large impacts or vibrations, suitable measures must be taken to reduce the amplitude or acceleration of such disturbances. Vibration-damping or vibration-absorbing systems are to be used in such cases.

Tests with regard to ambient conditions

Tests with regard to mechanical ambient conditions

The following table shows the type and extent of tests that were used to check the product with regard to mechanical ambient conditions.

Test	Physical quantity	Value, note
Vibrations EN 60068-2-6 (Version 2008)	Vibration	Sine
	Frequency range	5 ... 500 Hz Deflection 10 mm
		5 ... 500 Hz Vibration acceleration 30 m/s^2
Shock EN 60068-2-27 (Version 2009)	Shock form	Half sine
	Peak acceleration	250 m/s^2
	Pulse duration	11 ms
	Number of shocks per direction	50 per axis
	Number of axes	3

2.7 Personnel qualification

Inadequate qualifications of the personnel

If the personnel working with the product is not sufficiently qualified, the result may be serious injuries and significant property damage.

- All work may only be performed by qualified personnel.
- Before working with the product, the personnel must have read and understood the complete assembly and operating manual.
- Observe the national safety regulations and rules and general safety instructions.

The following personal qualifications are necessary for the various activities related to the product:

Trained electrician
Due to their technical training, knowledge and experience, trained electricians are able to work on electrical systems, recognize and avoid possible dangers and know the relevant standards and regulations.

Qualified personnel
Due to its technical training, knowledge and experience, qualified personnel is able to perform the delegated tasks, recognize and avoid possible dangers and knows the relevant standards and regulations.

Instructed person
Instructed persons were instructed by the operator about the delegated tasks and possible dangers due to improper behaviour.

Service personnel of the manufacturer
Due to its technical training, knowledge and experience, service personnel of the manufacturer is able to perform the delegated tasks and to recognize and avoid possible dangers.

2.8 Personal protective equipment

Use of personal protective equipment

Personal protective equipment serves to protect staff against danger which may interfere with their health or safety at work.

- When working on and with the product, observe the occupational health and safety regulations and wear the required personal protective equipment.
- Observe the valid safety and accident prevention regulations.
- Wear protective gloves to guard against sharp edges and corners or rough surfaces.
- Wear heat-resistant protective gloves when handling hot surfaces.
- Wear protective gloves and safety goggles when handling hazardous substances.
- Wear close-fitting protective clothing and also wear long hair in a hairnet when dealing with moving components.

2.9 Notes on safe operation

Incorrect handling of the personnel

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Avoid any manner of working that may interfere with the function and operational safety of the product.
- Use the product as intended.
- Observe the safety notes and assembly instructions.

- Do not expose the product to any corrosive media. This does not apply to products that are designed for special environments.
- Eliminate any malfunction immediately.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention and environmental protection regulations regarding the product's application field.

2.10 Transport

Handling during transport

Incorrect handling during transport may impair the product's safety and cause serious injuries and considerable material damage.

- When handling heavy weights, use lifting equipment to lift the product and transport it by appropriate means.
- Secure the product against falling during transportation and handling.
- Stand clear of suspended loads.

2.11 Malfunctions

Behavior in case of malfunctions

- Immediately remove the product from operation and report the malfunction to the responsible departments/persons.
- Order appropriately trained personnel to rectify the malfunction.
- Do not recommission the product until the malfunction has been rectified.
- Test the product after a malfunction to establish whether it still functions properly and no increased risks have arisen.

2.12 Disposal

Handling of disposal

The incorrect handling of disposal may impair the product's safety and cause serious injuries as well as considerable material and environmental harm.

- Follow local regulations on dispatching product components for recycling or proper disposal.

2.13 Fundamental dangers

General

- Observe safety distances.

- Never deactivate safety devices.
- Before commissioning the product, take appropriate protective measures to secure the danger zone.
- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- If the energy supply is connected, do not move any parts by hand.
- Do not reach into the open mechanism or movement area of the product during operation.

2.13.1 Protection during handling and assembly

Incorrect handling and assembly

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Have all work carried out by appropriately qualified personnel.
- For all work, secure the product against accidental operation.
- Observe the relevant accident prevention rules.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

Incorrect lifting of loads

Falling loads may cause serious injuries and even death.

- Stand clear of suspended loads and do not step into their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.

2.13.2 Protection during commissioning and operation

Falling or violently ejected components

Falling and violently ejected components can cause serious injuries and even death.

- Take appropriate protective measures to secure the danger zone.
- Never step into the danger zone during operation.

2.13.3 Protection against dangerous movements

Unexpected movements

Residual energy in the system may cause serious injuries while working with the product.

- Switch off the energy supply, ensure that no residual energy remains and secure against inadvertent reactivation.

- The faulty actuation of conected drives may cause dangerous movements.
- Operating mistakes, faulty parameterization during commissioning or software errors may trigger dangerous movements.
- Never rely solely on the response of the monitoring function to avert danger. Until the installed monitors become effective, it must be assumed that the drive movement is faulty, with its action being dependent on the control unit and the current operating condition of the drive. Perform maintenance work, modifications, and attachments outside the danger zone defined by the movement range.
- To avoid accidents and/or material damage, human access to the movement range of the machine must be restricted. Limit/prevent accidental access for people in this area due through technical safety measures. The protective cover and protective fence must be rigid enough to withstand the maximum possible movement energy. EMERGENCY STOP switches must be easily and quickly accessible. Before starting up the machine or automated system, check that the EMERGENCY STOP system is working. Prevent operation of the machine if this protective equipment does not function correctly.

2.13.4 Protection against electric shock

Work on electrical equipment

Touching live parts may result in death.

- Work on the electrical equipment may only be carried out by qualified electricians in accordance with the electrical engineering regulations.
- Lay electrical cables properly, e. g. in a cable duct or a cable bridge. Observe standards.
- Before connecting or disconnecting electrical cables, switch off the power supply and check that the cables are free of voltage. Secure the power supply against being switched on again.
- Before switching on the product, check that the protective earth conductor is correctly attached to all electrical components according to the wiring diagram.
- Check whether covers and protective devices are fitted to prevent contact with live components.
- Do not touch the product's terminals when the power supply is switched on.

Possible electrostatic energy

Components or assembly groups may become electrostatically charged. When the electrostatic charge is touched, the discharge may trigger a shock reaction leading to injuries.

- The operator must ensure that all components and assembly groups are included in the local potential equalisation in accordance with the applicable regulations.
- While paying attention to the actual conditions of the working environment, the potential equalisation must be implemented by a specialist electrician according to the applicable regulations.
- The effectiveness of the potential equalisation must be verified by executing regular safety measurements.

2.13.5 Protection against magnetic and electromagnetic fields

Work in areas with magnetic and electromagnetic fields

Magnetic and electromagnetic fields can lead to serious injuries.

- Persons with pace-makers, metal implants, metal shards, or hearing aids require the consent of a physician before entering areas in which components of the electric drive and control systems are mounted, started up, and operated.
- Persons with pace-makers, metal implants, metal shards, or hearing aids require the consent of a physician before entering areas in which magnetic grippers or motor parts with permanent magnets are stored, repaired, or assembled.
- Do not operate high-frequency or radio devices in the proximity of electric components of the drive system and their feed lines.

  If the use of such devices is necessary:

  When starting up the electric drive and control system, check the machine or automated system for possible failures when such systems are used at different intervals and in different states of the control system. A special additional EMC test may be necessary if the system has a high risk potential.

2.14 Notes on particular risks

⚠ DANGER

Danger from electric voltage!

Touching live parts may result in death.

- Switch off the power supply before any assembly, adjustment or maintenance work and secure against being switched on again.
- Only qualified electricians may perform electrical installations.
- Check if de-energized, ground it and hot-wire.
- Cover live parts.

⚠ DANGER

Risk of fatal injury from suspended loads!

Falling loads can cause serious injuries and even death.

- Stand clear of suspended loads and do not step within their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.
- Wear suitable protective equipment.

⚠ WARNING

Risk of injury from objects falling and being ejected!

Falling and ejected objects during operation can lead to serious injury or death.

- Take appropriate protective measures to secure the danger zone.

⚠ WARNING

Risk of injury due to unexpected movements!

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.

⚠ WARNING

Risk of injury from crushing and impacts!

Serious injury could occur during movement of the base jaw, due to breakage or loosening of the gripper fingers or if the workpiece is lost.

- Wear suitable protective equipment.
- Do not reach into the open mechanism or the movement area of the product.

⚠ WARNING

Risk of injury from sharp edges and corners!

Sharp edges and corners can cause cuts.

- Use suitable protective equipment.

⚠ WARNING

Risk of injury from objects falling in the event of an energy supply failure

In case of an energy supply failure, the gripping force decreases and a secure hold on the gripped workpiece cannot be guaranteed.

- Take suitable protective measures to secure the danger zone.

3 Technical data

3.1 Basic data

Mechanical operating data	
Weight [kg]	1.8
Noise emission [dB(A)]	≤ 70
IP rating*	46
Ambient temperature [°C] Min. Max.	 5 55
Brake	
Brake	available **
Internal motor operating data	
Motor current at nominal gripping force [A]	4.25
Internal logic supply fuse * **	
Value [A] Tripping characteristic	1 time delay
Power supply	
Logic voltage supply [VDC]	24 ± 10%
Voltage supply output [VDC] (stabilized and smoothed, internal reverse polarity protection) maximum current input (logic) [A] maximum current input (power) of power supply unit [A]	24 ± 10% 0.5 2.5
Interface	
PROFIBUS [12 MBit/s]	X
CAN bus [up to 1 MBit/s]	X
USB Mini AB, device, parameterization interface	X
USB Micro AB, host	X
IMPORTANT! A product is supplied either with PROFINET or CAN bus.	

* For use in dirty ambient conditions (e.g. sprayed water, vapors, abrasion or processing dust) SCHUNK offers corresponding product options as standard. SCHUNK also offers customized solutions for special applications in dirty ambient conditions.

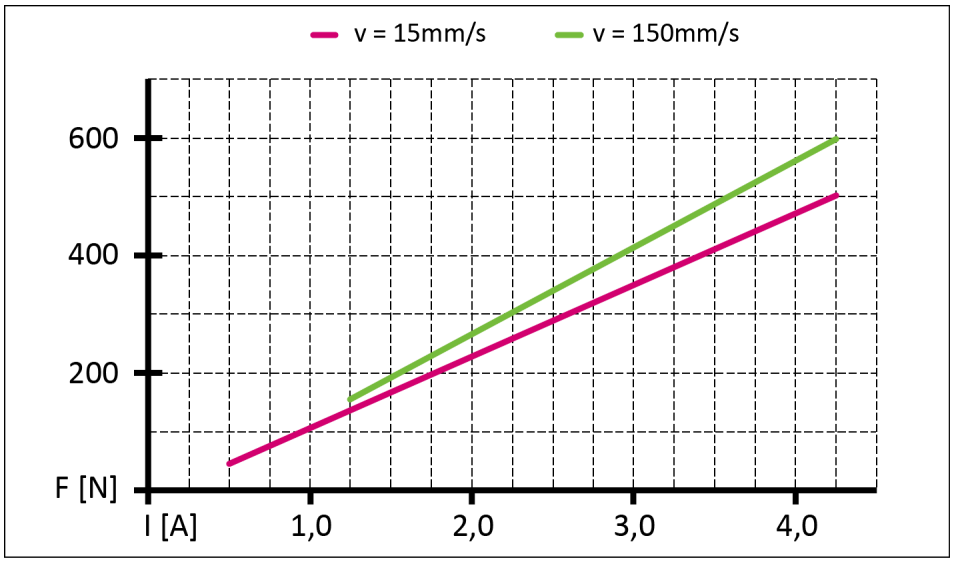
* The built-in, electric holding break is used for mounting and
* holding the position of the gripper jaws in the event of a power failure. It cannot cover all of the safety or gripping force maintenance functions.

* SCHUNK recommends: Littelfuse 1A time delay (0154001 .DRTL)
*
*

More technical data is included in the catalog data sheet. Whichever is the latest version.

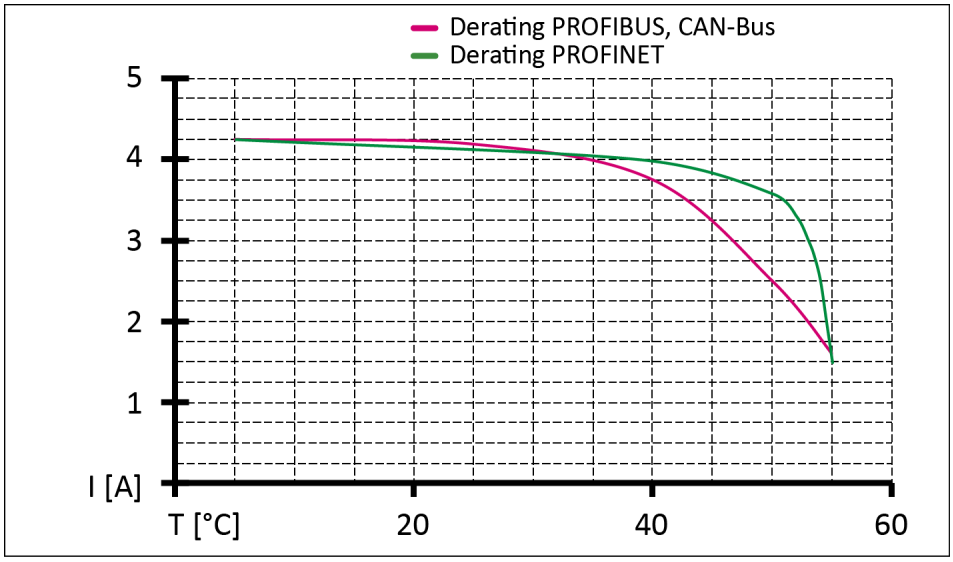
3.2 Diagrams

NOTE
The following diagrams refer to the motor current. This is internal and is controlled via the SPS programming.



Gripping force diagram

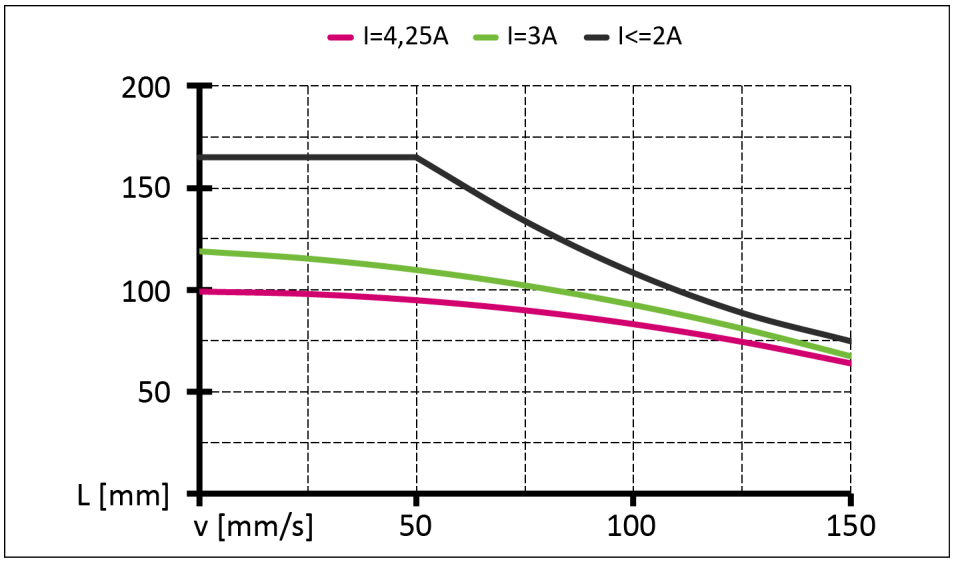
The gripping force diagram shows the achievable gripping force at 15 mm/s and 150 mm/s with the relevant motor current.



Derating diagram

Depending on the ambient temperature, continuous gripping is only permitted with reduced motor current. Otherwise the product will overheat and signal a malfunction.

To determine the nominal gripping force, the product is installed with a positive locking on an aluminum plate. The 200x200x20 mm³ large aluminum plate is isolated to the ground. With an ambient temperature of 22 °C, the product can hold with the nominal gripping force for at least 5 hours.

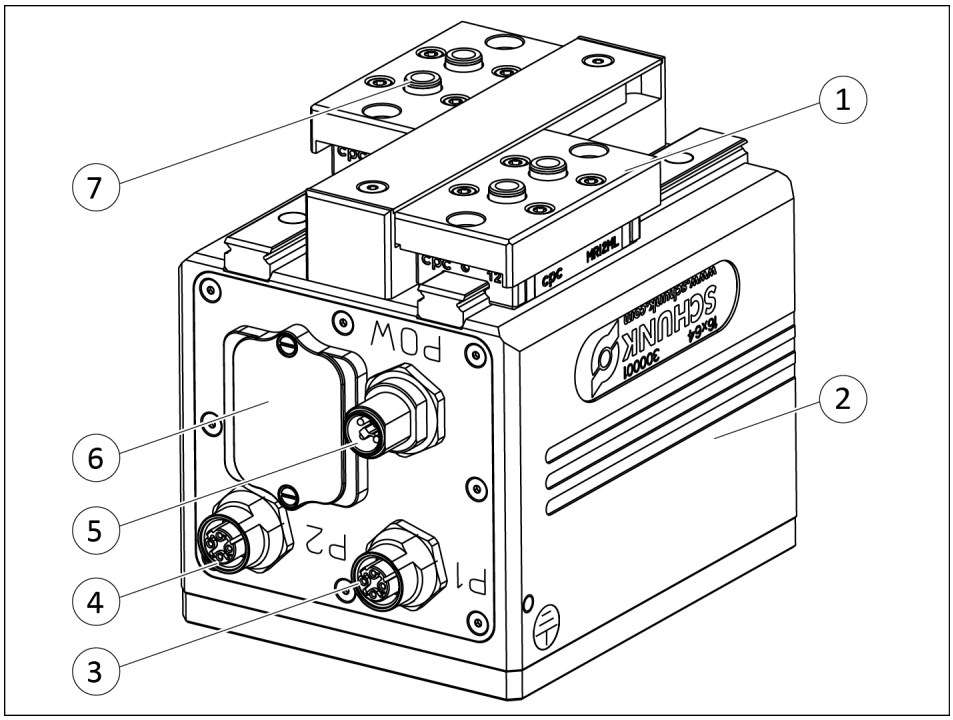


v-L diagram

The v-L diagram shows the maximum finger length according to the set motor current and the process speed. If the maximum finger length is exceeded, the guides will wear prematurely.

4 Design and description

4.1 Design



EGL 2-finger parallel gripper

1	Finger interface
2	Housing
3	PROFIBUS or CAN bus socket
4	PROFIBUS or CAN bus connector
5	Voltage supply connector
6	Service window
7	Finger centering sleeves

4.2 Description

The product is a servo-electric 2-finger parallel gripper featuring high power density and integrated electronics.

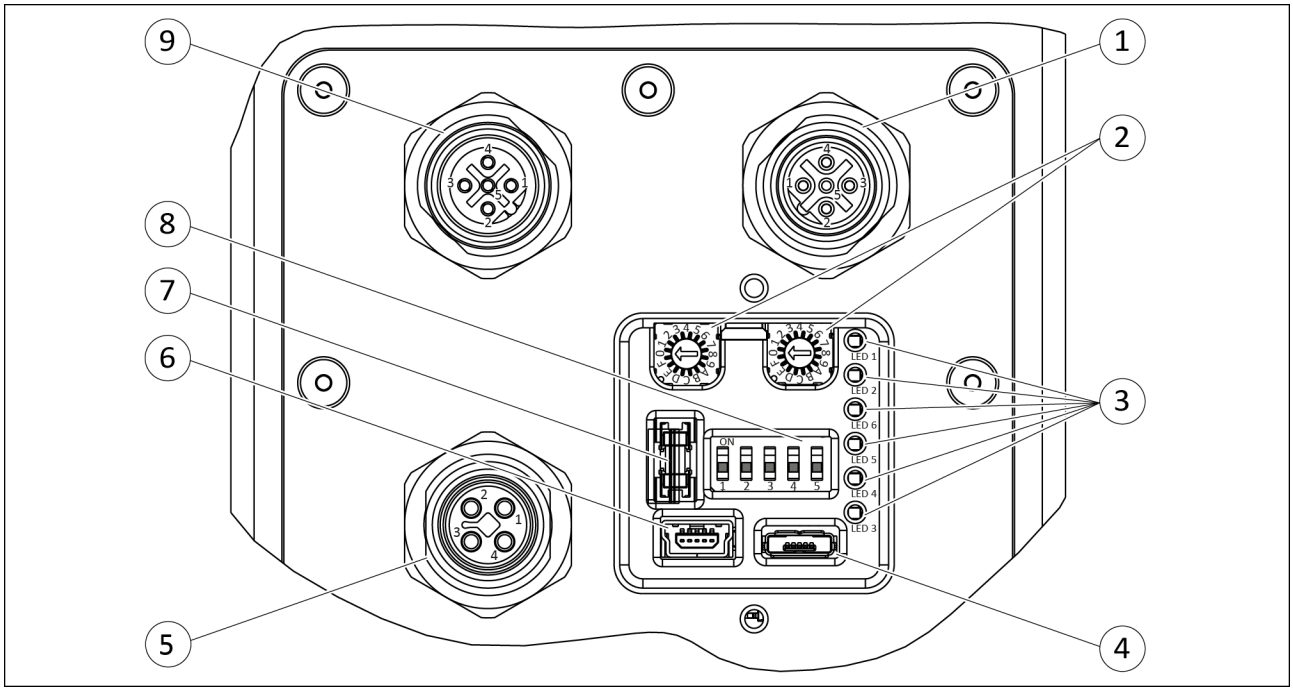
Depending on the variant, the bus system is either PROFIBUS or CAN bus.

Depending on the bus system, various address ranges and communication protocols are available:

	Address range	Communication protocol
PROFIBUS	0–127	SDP* / SMP
CAN bus	0–255	SMP

*) recommended by SCHUNK

4.3 Interfaces and service windows



Interfaces and service window, PROFIBUS and CAN bus variant

Item	Designation	Function
1	PROFIBUS or CAN bus connector	Communication input
2	Rotary encoding switch	Address configuration for PROFIBUS or CAN bus
3	LED	Status display and error analysis
4	USB Micro AB, host*	Firmware update via USB flash drive
5	Voltage supply connector	Logic and power supply
6	USB mini AB, device*, parameterized interface	Service interface, parameterization and firmware update via computer
7	Logic supply fuse	Protection for logic supply, 1 A, time delay
8	DIP switch	Testing and commissioning functions, adjustment of baud rate for CAN bus
9	PROFIBUS or CAN bus socket	Communication output or termination resistor

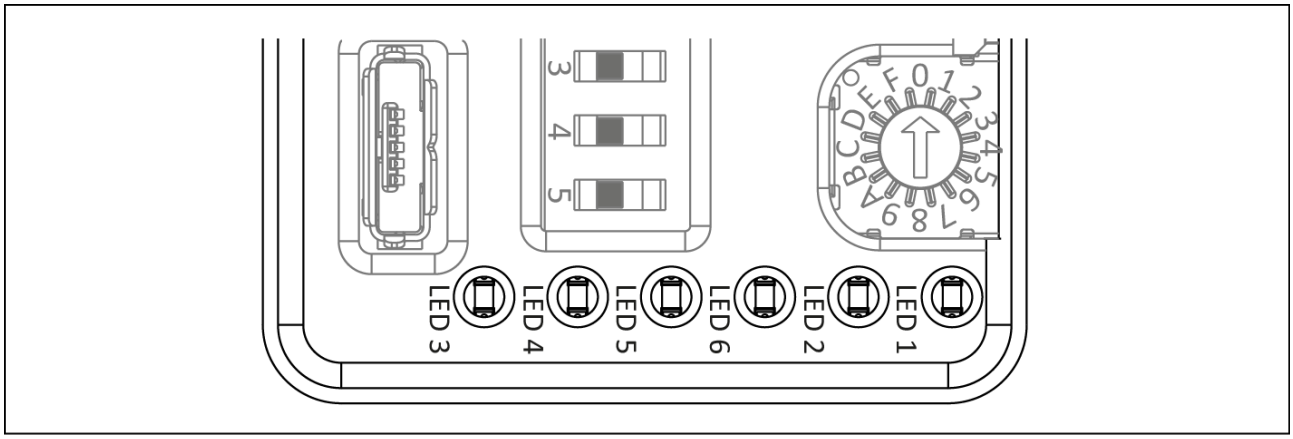
*) **IMPORTANT! Do not load the USB interface from the side as it may be damaged.**

If a device is connected to one or both USB interfaces, the respective bus connection will not function even if a bus cable is connected.

In the following cases, communication via the bus connection is not possible:

- If a USB device is connected to the interface USB mini AB, device.
- When connecting the USB stick to the interface USB micro AB, host and when the DIP switch 1 is "ON".

4.3.1 LED

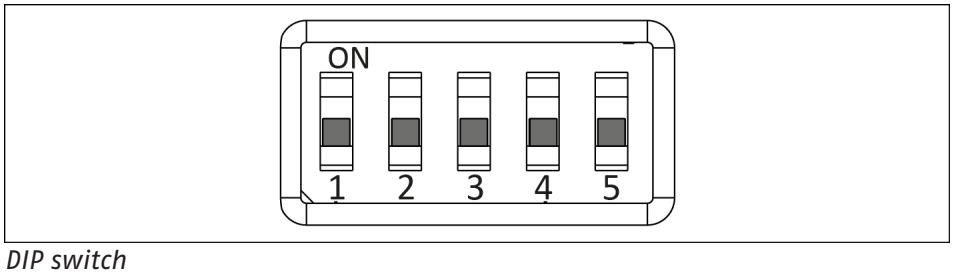


LED, PROFIBUS and CAN bus variant

LED	Designation	Color	Function
1	Supply power	green	Indicates whether the power supply is connected. • **Lights up** when the power supply for the product is connected.
2	Logic supply	green	Indicates whether the logic voltage is connected. • **Lights up** when the power supply for the product is connected.
3	Module status	yellow	Indicates the operating condition of the product. • **Lights up** if the product is ready for operation. • **Does not light up** if there is an error. • **Does not light up** if there is a warning. • **Lights up** if there is an info message. • **Flashes** if the hardware is not recognized or if the status of the software is undefined (alternating with "module error" LED). • **Flashes** if a firmware update is being installed via USB Micro AB, host (CAN bus communication interface). • **Lights up** if a firmware update is being installed via USB Micro AB, host (PROFIBUS communication interface).
4	Module error	red	Indicates if there is an error; see "SCHUNK Motion Protocol (SMP)" and "SCHUNK Drive Protocol (SDP)" software manuals. • **Lights up** if there is an error.

LED	Designation	Color	Function
			• **Does not light up** if the product is ready for operation. • **Flashes** if there is a warning. • **Flashes briefly** if there is an info message (on/off about 5 times). • **Flashes** if the hardware is not recognized or if the status of the software is undefined (alternating with "module status" LED). • **Lights up (approximately 1 second) and goes out** before the logic board is updated during a firmware update via USB Micro AB, host. **Flashes** when the logic board is updating. **Lights up** when the adapter board is being updated and goes out when the update is finished.
5	PROFIBUS or CAN bus operation	yellow	Indicates whether there is communication. • **Lights up** if there is communication via CAN bus. **Flashes briefly** with each change of direction (on/off about 2 times). • **Lights up** if there is communication via PROFIBUS. • **Does not light up** if communication via PROFIBUS or CAN bus is interrupted.
6	PROFIBUS or CAN bus off state	red	Indicates whether communication has been interrupted. • **Lights up** if communication via PROFIBUS or CAN bus has been interrupted. • **Does not light up** if there is communication via PROFIBUS or CAN bus.

4.3.2 DIP switch



DIP switch

Item	Designation	Function
1	Enable USB host	Enable USB host for firmware update, ▶ 5.10.2 [🗋 50]
2	Test 1	Perform quick test on the product, ▶ 5.8 [🗋 38]

Item	Designation	Function
3	Test 2	Perform quick test on the product, ▶ 5.8 [🗋 38]
4	CAN baud rate 1	Set baud rate for CAN bus, ▶ 5.6 [🗋 36]
5	CAN baud rate 2	Set baud rate for CAN bus, ▶ 5.6 [🗋 36]

4.4 Functional principle

All possible parameters and the special features of each communication interface (of the individual bus systems) are described in the software handbook of the respective protocol, see "SCHUNK Drive Protocol (SDP)" and "SCHUNK Motion Protocol (SMP)" software manuals.

SCHUNK recommends using the "SDP" protocol.

5 Assembly and settings

5.1 Mechanical connection

Evenness of the mounting surface

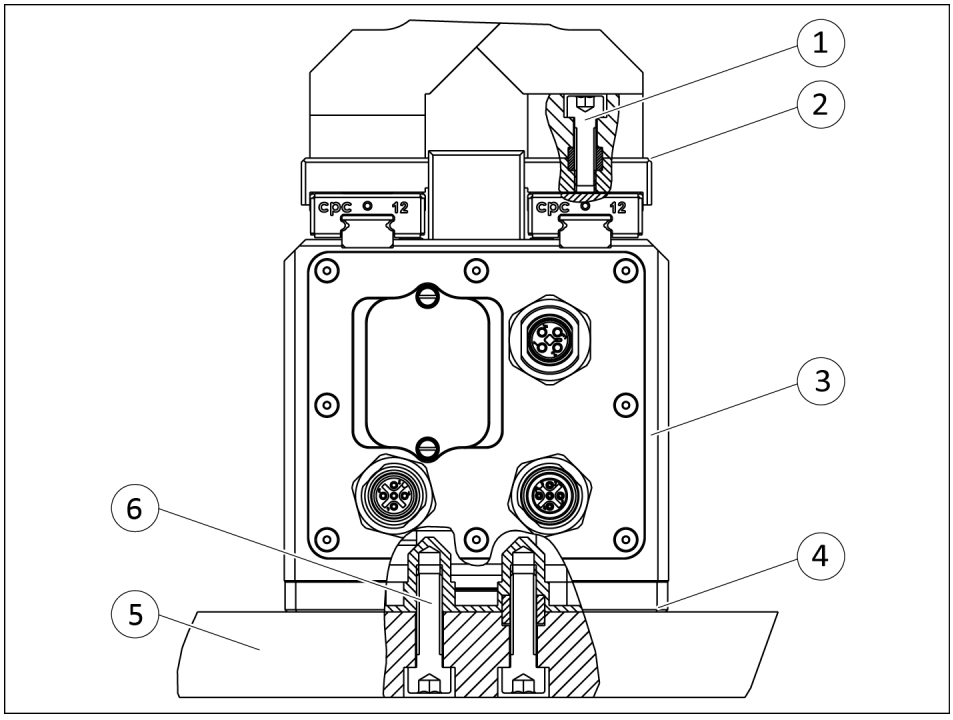
The values apply to the whole mounting surface to which the product is mounted.

Edge length	Permissible unevenness
< 100	< 0.02
> 100	< 0.05

Tab.: Requirements for evenness of the mounting surface (Dimensions in mm)

Choose the installation position so that connection cables are not damaged or cannot wrap around the product when swiveling.

- Connect the product to the machine/system with screws.
  - ⇨ Use suitable connecting elements (adapter plates) if necessary.
  - ⇨ Observe the permissible depth of engagement.
  - ⇨ Observe the tightening torque for the mounting screws.



Assembly example, EGL PROFIBUS/CAN bus variant with connecting element adapter plate

Item	Designation	Note
1	Fastening screws Finger to base jaw	Specifications for the mounting screws: See the following table
2	Finger interface	

Item	Designation	Note
3	Housing	
4	Adapter plate interface	
5	Adapter plate	See catalog (accessories)
6	Fastening screws Product to adapter plate	Specifications for the mounting screws: See the following table

Designation	EGL
Thread	M6
Minimum depth of engagement [mm]	10
Maximum depth of engagement [mm]	11
Centering sleeve [Ø]	10
Tightening torque [Nm]	10.1

Tab.: Depth of engagement and tightening torque, product to adapter plate

Designation	EGL
Thread	M5
Minimum depth of engagement [mm]	7.5
Maximum depth of engagement [mm]	7.8
Centering sleeve [Ø]	8
Tightening torque [Nm]	5.9

Tab.: Depth of engagement and tightening torque, finger to base jaw

5.2 Electrical connection

CAUTION

Risk of damage to the electronics!

A faulty connection can cause damage to the internal electronics.

- The supply network must be a network of type "PELV" for power and logic.
- Observe the PIN assignment of the connecting terminals.
- Make sure that all components are grounded correctly.

NOTE

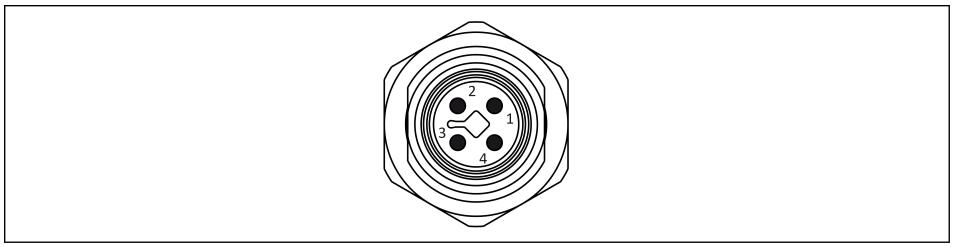
Note on EMC conformity (according to EN 61000-6-3: 2007+A1:2011):

- The product may only be used in DC distribution networks with an expansion of < 30 m.

5.2.1 Pin allocation

Power supply

The power is supplied via an M12 plug. The plug is T-coded.

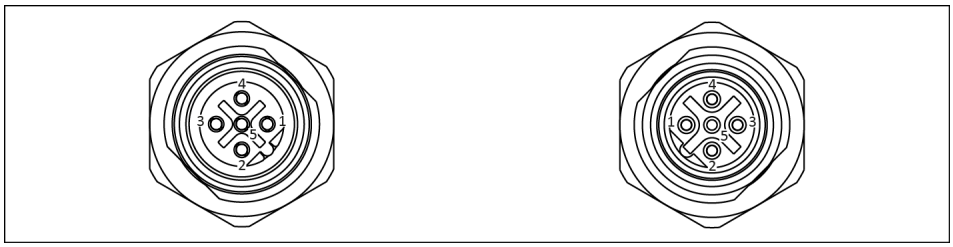


Pin allocation for power supply plug

1	Logic+	3	GND
2	GND	4	Power+

Profibus and CAN bus

Profibus and CAN bus are connected via an M12 plug and an M12 socket. The plug and socket of the Profibus are B-coded. The plug and socket of the CAN bus are A-coded.



PIN allocation of socket and plug for Profibus oder CAN bus

Profibus			
1	+5V bus	4	PB-B
2	PB-A	5	–
3	PB-GND		
CAN bus			
1	FE	4	CAN-H
2	–	5	CAN-L
3	GND-CAN		

5.2.2 Cable connections

CAUTION

Damage to the connecting plugs and cables possible!

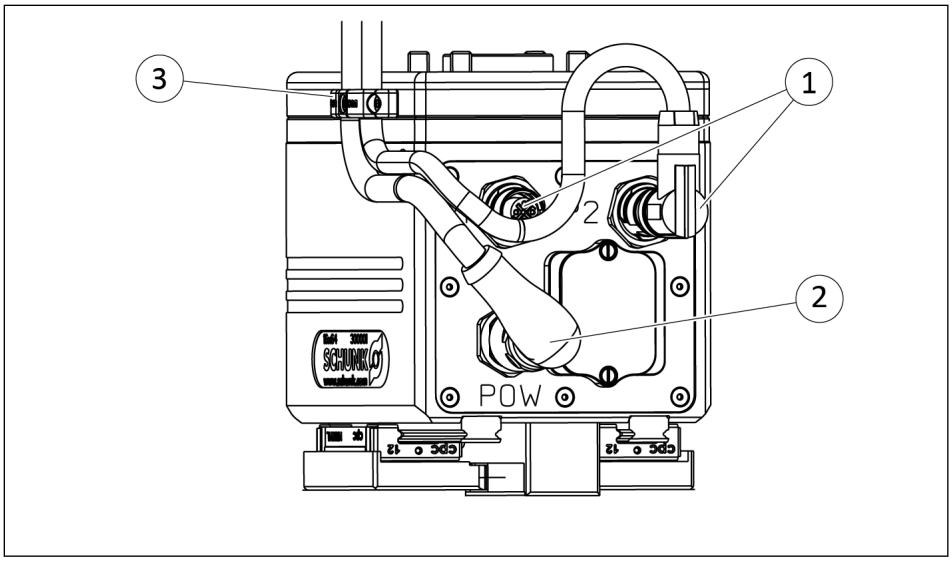
The connecting cables must not transfer any mechanical loads (tension, pressure, vibrations) to the connecting plugs.

- Provide strain relief (3) for all connecting cables near the connecting plug.
- If required, use cable tracks, cable hoses, etc.
- Observe the permissible bending radii of the connecting cables used.

CAUTION

Material damage due to incorrect assembly!

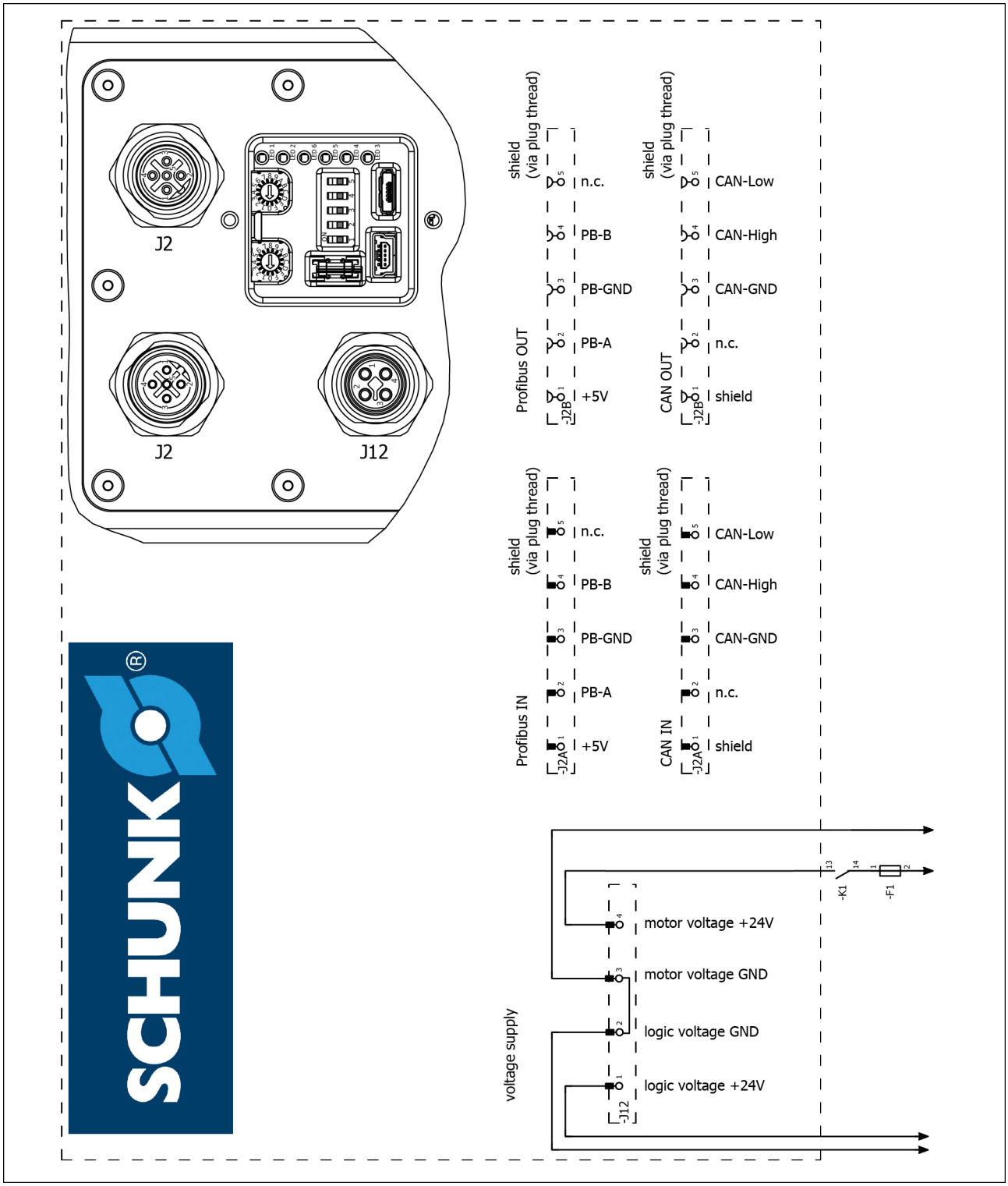
- When connecting the cable, do not exceed the maximum tightening torque of 0.8 Nm for the cable.



Cable outlets and strain relief

1	Communication cable (PROFIBUS, CAN bus)
2	Voltage supply cable
3	Cable outlets and strain relief (shown as an example)

5.2.3 Wiring diagram



Wiring diagramm

5.2.4 External protection

The power circuit of the EGL needs to be protected by a fuse provided by the customer, ▶ 3 [🗋 20].

5.3 Assembling and connecting

⚠ DANGER

Danger from electric voltage!

Touching live parts may result in death.

- Switch off the power supply before any assembly, adjustment or maintenance work and secure against being switched on again.
- Only qualified electricians may perform electrical installations.
- Check if de-energized, ground it and hot-wire.
- Cover live parts.

⚠ WARNING

Risk of injury due to unexpected movements!

If the power supply is switched on or residual energy remains in the system, components can move unexpectedly and cause serious injuries.

- Before starting any work on the product: Switch off the power supply and secure against restarting.
- Make sure, that no residual energy remains in the system.

NOTE

Mount the product so that sufficient heat dissipation is guaranteed. A temperature malfunction may occur if the product reaches excessively high temperatures.

Overview

1. Check the evenness of the mounting surface, ▸ 5.1 [🗋 28].
2. Screw the product to the machine/system, ▸ 5.1 [🗋 28].
   - ⇨ If necessary, use appropriate connection elements (adapter plates).
   - ⇨ Observe the maximal tightening torque, admissible screw-in depth and, if necessary, strength class.
3. Connect the ground cable between the product and the machine/system, ▸ 5.4 [🗋 35].
4. Plug the cable for the fieldbus into the plug and screw it in by hand, ▸ 5.2.2 [🗋 31].
   If the cable is tightened with a tool, for example a wrench, observe maximum tightening torque, ▸ 5.2.2 [🗋 31].

5. If applicable: connect multiple products to each other, ▸ 5.5 [🗋 35].

Only PROFIBUS or CAN bus:

6. On the last product, plug the termination resistor into the socket.
7. Set address of PROFIBUS or CAN bus via the rotary encoding switch, ▸ 5.7 [🗋 37].

Only CAN bus:

8. Set the baud rate, ▸ 5.6 [🗋 36].

All communication interfaces:

CAUTION

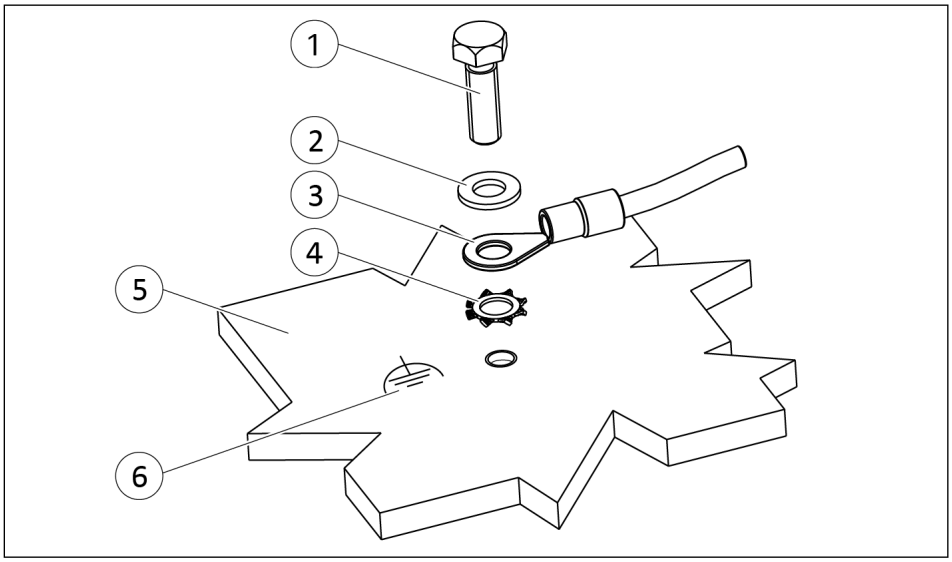
Material damage due to erroneous control!

If the DIP switch is in the "ON" position when switching on the voltage supply, the product may become damaged.

- Before switching on the product, move the DIP switch into the "OFF" position.

9. If necessary, move the DIP switch "1" into the "OFF" position.
10. Plug the power supply cable into the plug and screw it in tight, ▸ 5.2.2 [🗋 31].
    If the cable is tightened with a tool, for example a wrench, observe maximum tightening torque, ▸ 5.2.2 [🗋 31].
    ⇨ "Power supply" LED 1 lights up green.
    ⇨ "Logic supply" LED 2 lights up green.
    ⇨ "Module status" LED 3 flashes yellow.
    ⇨ "Module error" LED 4 does not light up.

5.4 Connecting the ground cable (functional ground)



Ground connection

1	Screw *	4	Toothed lock washer
2	Washer	5	Product
3	Cable lug	6	Ground marking

*) Tightening torque: 5 Nm

A ground connection with a sufficient cross-section must be established between the product and the machine on the customer's premises.
Mount the ground cable (functional ground) on the threaded hole marked with the ground marking.

NOTE

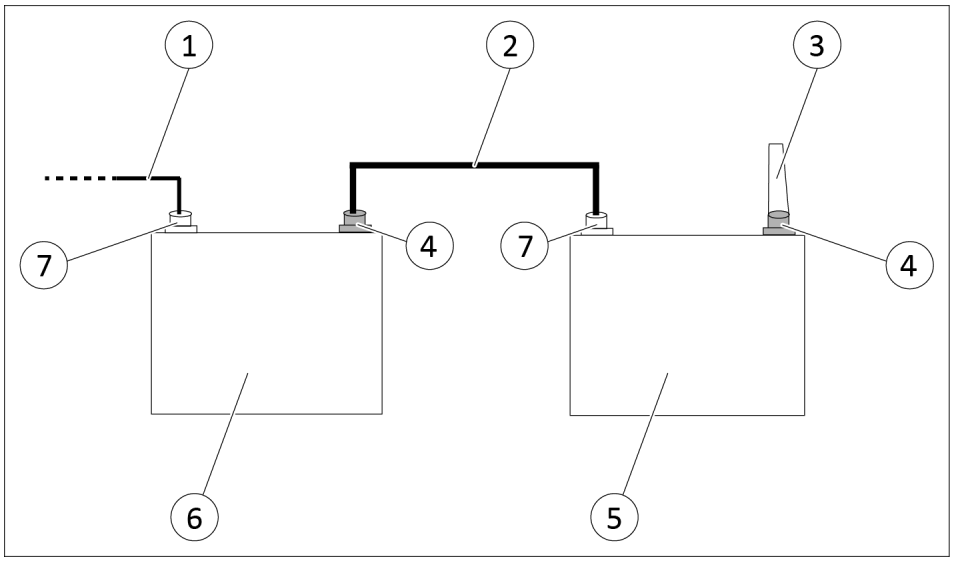
Only connect the ground cable (functional ground) at the location intended for this purpose.

Always mount the ground cable individually. A green-yellow wire strand color is not permitted.

Always use all components to fasten the ground cable (functional ground) and install them in this order: toothed lock washer, cable lug, washer and screw. See "Ground connection" diagram. Observe the tightening torque.

5.5 Combining several products (PROFIBUS, CAN bus)

This chapter describes the combination of products for the EGL PROFIBUS or EGL CAN bus variants.



Combining multiple products

1	Bus cable 1	5	Product n+1
2	Bus cable 2	6	Product n
3	Terminating resistor (only for PROFIBUS or CAN bus)	7	PROFIBUS or CAN bus connector
4	PROFIBUS or CAN bus socket		

When multiple products are combined, the signals are looped through from product "n" to product "n+1".

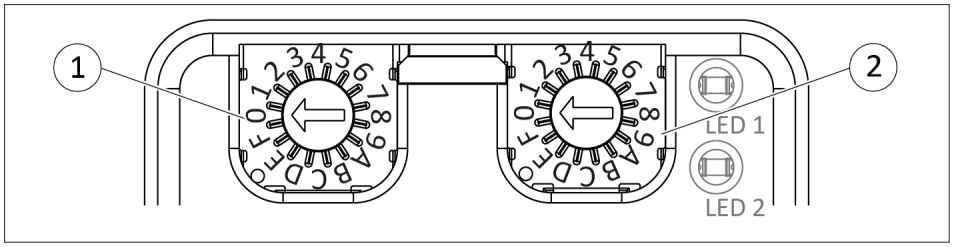
1. Plug bus cable 2 from the socket of the product "n" onto the connector of product "n+1".
2. On the last product, plug the termination resistor onto the socket.

5.6 Setting the baud rate (CAN bus)

The baud rate is only set for variants with CAN bus. The baud rate is set via DIP switches "4" and "5",
▸ 4.3.2 [🗋 26]. The following settings are possible:

DIP switch 4	DIP switch 5	Baud rate
OFF	OFF	125 kbaud
ON	OFF	250 kbaud
OFF	ON	500 kbaud
ON	ON	1000 kbaud

5.7 Configuring PROFIBUS or CAN bus



Rotary encoder switch

Item	Designation	Note
1	Rotary encoder switch "S1"	For setting the less significant digit (half byte).
2	Rotary encoder switch "S2"	For setting the more significant digit (half byte).

NOTE

The CAN bus or PROFIBUS address is configured as a hexadecimal code on the product. The hexadecimal value "0" means decimal "0" and the hexadecimal value "F" means decimal "15". To show the hexadecimal address as a decimal value, multiply the more significant digit (rotary encoder switch "S2") by factor 16 and the less significant digit (rotary encoder switch "S1") by factor 1, see table for configuring the CAN bus or PROFIBUS address. Then add the two values.

Example: Configuring address CAN bus 31

Set rotary code switch "S1" to "F" (decimal 15*1) and rotary code switch "S2" to "1" (decimal 1*16).

1. Switch off the logic voltage.
2. Set the desired fieldbus address by turning the "S1" and "S2" rotary encoder switches.
   ⇨ The rotary encoder switch must engage into the desired position.
3. Switch on the logic voltage.

Fieldbus	Decimal address range	Hexadecimal address range
PROFIBUS	0–125	00–7D
CAN bus	0–255	00–FF

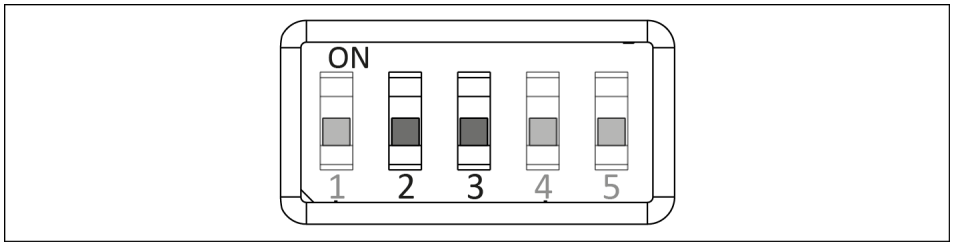
Tab.: CAN bus and PROFIBUS address range

Hexadecimal address		Decimal address
Rotary encoder switch "S1"	Rotary encoder switch "S2"	
0	0	0

Hexadecimal address		Decimal address
Rotary encoder switch "S1"	Rotary encoder switch "S2"	
1	0	1
...	0	...
F	0	15
0	1	16
...	1	...
F	1	31
0	2	32
...	...	...
D	7	125
...	...	...
F	F	255

Tab.: Address configuration for CAN bus or PROFIBUS

5.8 Performing a quick test



DIP switch

DIP switch	Designation
2	Test 2
1	Test 3

Via the USB device or the bus interface, a quick test can be performed with the DIP switches 2 "Test 2" and 3 "Test 1". The USB host must be inactive for the quick test.

The following commands are supported:

DIP switch			
Test 1	Test 2	Command	Function
0	0	–	Wait for new command
0	1	CMD ACK	Acknowledgment of a pending error message
1	1	CMD REFERENCE	A reference run is executed

DIP switch			
Test 1	Test 2	Command	Function
1	0	Relative travel	Relative travel by 1.0 mm or 1.0 degree with 10% maximum speed, 10% maximum acceleration, 50% nominal current and 50% maximum jerk

- DIP switches 2 "Test 2" and 3 "Test 1" are in "OFF" position

1. If the "Error module" LED lights up: Switch DIP switch 3 "Test 1" to "ON" position.
   ⇨ A pending error message is acknowledged.
   ⇨ If the error is still present after acknowledgment, see "SCHUNK Motion Protocol (SMP)" and "SCHUNK Drive Protocol (SDP)" software manuals and ▶ 7 [🗋 60].
2. Switch DIP switch 2 "Test 2" to "OFF" position.
3. Switch DIP switches 2 "Test 2" and 3 "Test 1" to "ON" position.
   ⇨ Product moves to parameterized reference value.
4. Switch DIP switches 2 "Test 2" and 3 "Test 1" to "OFF" position.
5. Switch DIP switch 3 "Test 1" to "ON" position.
   ⇨ Relative travel is executed.
6. Switch DIP switch 3 "Test 1" to "OFF" position.
7. Switch logic voltage off and back on again.
   ⇨ Test mode is ended.
   ⇨ Product is restarted.

5.9 Commissioning the product

NOTE

The product has either a CAN bus or a PROFIBUS connection and always USB interfaces ("X1" and "X2").

If the computer has an interface for CAN or PROFIBUS, the product can be connected for commissioning with the "Motion Tool SCHUNK (MTS)" software to the computer via the bus interface or via a USB interface ("X1" or "X2").

If a device is connected to one or both USB interfaces, the respective bus connection will not function even if a bus cable is connected.

In the following cases, communication via the bus connection is not possible:

- If a USB device is connected to the interface USB mini AB, device.
- When connecting the USB stick to the interface USB micro AB, host and when the DIP switch 1 is "ON".

The product is commissioned by means of the "Motion Tool SCHUNK (MTS)" configuration and commissioning tool.

When you open the "Motion Tool SCHUNK (MTS)", you must select the interface you wish to use for communication.

The following section describes commissioning and communication via the USB interface.

Download "Motion Tool SCHUNK (MTS)" via QR code slip from schunk.com.

Copy the "MTS" folder to any directory on the computer.
IMPORTANT! Motion Tool SCHUNK (MTS) does not require any installation!
We recommend using a directory for which you have write permission so that the settings that you make for the "Motion Tool SCHUNK (MTS)" can be saved and retained.

Default values for motions are predefined for the product as standard values. The following default values apply after the restart:

- Target speed
  - 10% of maximum value
- Target acceleration
  - 10% of maximum value
- Target jerk
  - 50% of maximum value

If these values are changed, the change is only saved temporarily, for as long as the product is connected to the logic voltage. When the logic voltage is disconnected from the product and switched on again, the product is always reset to these default values.

- The address for CAN bus or PROFIBUS has been set
- The baud rate has been set
- The product has been mechanically and electrically connected

1. Download the commissioning software via the QR code slip from schunk.com and install the USB driver, ▸ 5.9.1 [🗋 41].
2. Connect the product to the computer, ▸ 5.9.2 [🗋 42].
3. Open "Motion Tool SCHUNK (MTS)" via "mts.exe", ▸ 5.9.3 [🗋 43].

4. Perform initial commissioning via "Motion Tool SCHUNK (MTS)", ▶ 5.9.4 [🗋 45].

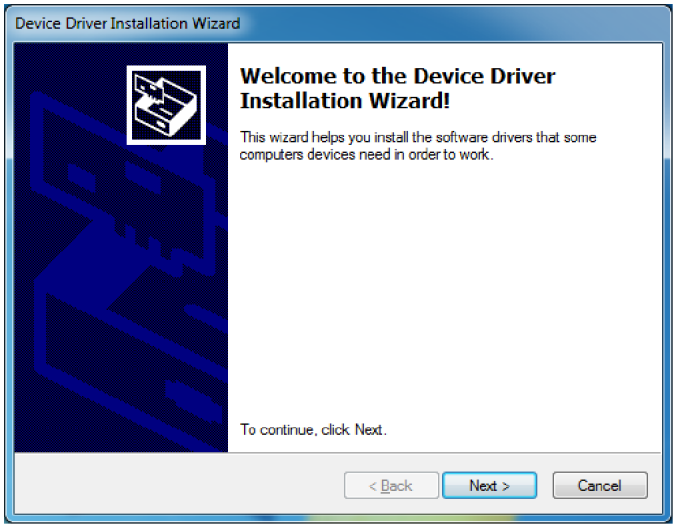
5.9.1 Install the USB driver

NOTE

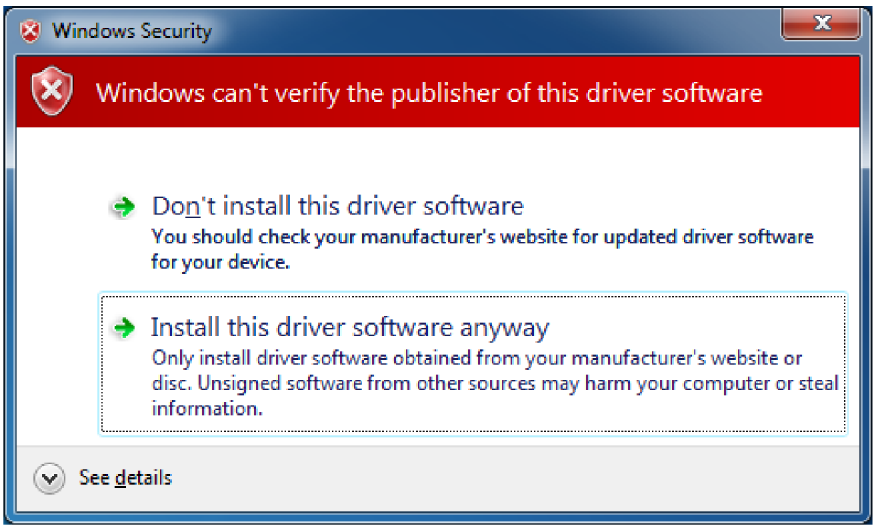
The USB driver is only preinstalled on the computer. When a new product is connected to the computer, the USB driver must be installed for the product, ▶ 5.9.2 [🗋 42].

Procedure for Windows 7

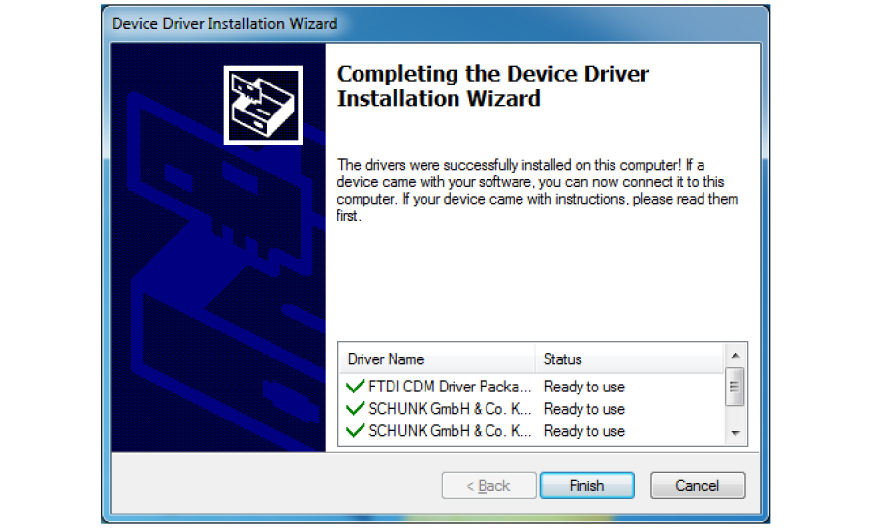
1. Download the commissioning software via the QR code slip from schunk.com and select the directory "SCHUNK USB Drivers".
2. Execute the installation file.
   - ⇨ **For 64-bit systems:** install_x64.exe
   - ⇨ **For 32-bit systems:** install_x86.exe



   - ⇨ The "Device Driver Installation Wizard" window appears.
3. Click the "Continue" button.
   - ⇨ The USB driver is installed.



4. If the "Windows Security" window appears during the installation, choose "Install this driver software anyway".



⇨ After successful installation, the "Device Driver Installation Wizard" window appears.

5. Click the "Finish" button.

⇨ USB driver installation is finished.

5.9.2 Connecting the product to the computer

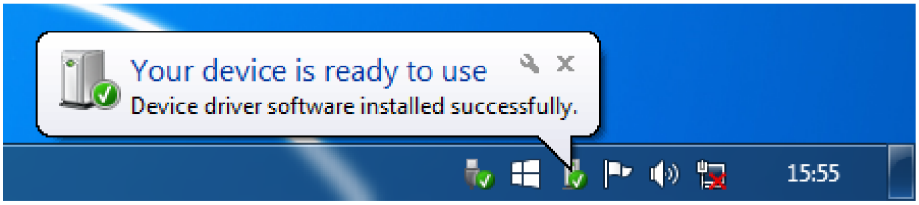
NOTE

When a new product is connected to the computer, the USB driver must be installed for the product.

Procedure for Windows 7

- The USB driver is preinstalled on the computer
- The power supply of the product is connected.

• Connect the USB cables to the computer and to the USB Mini AB, Device on the product.

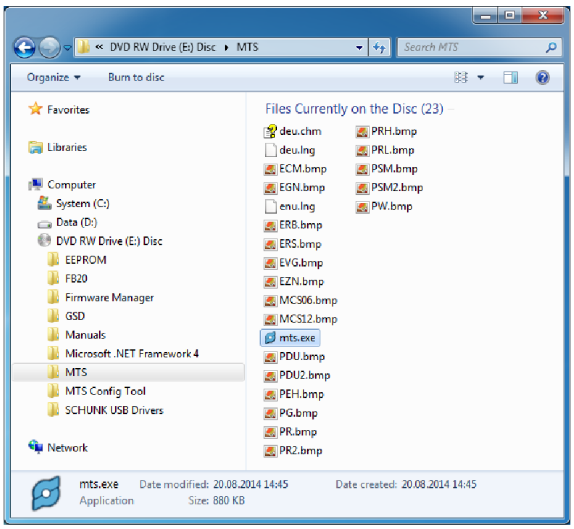


⇨ A new product is detected and the USB driver is automatically installed for this product.

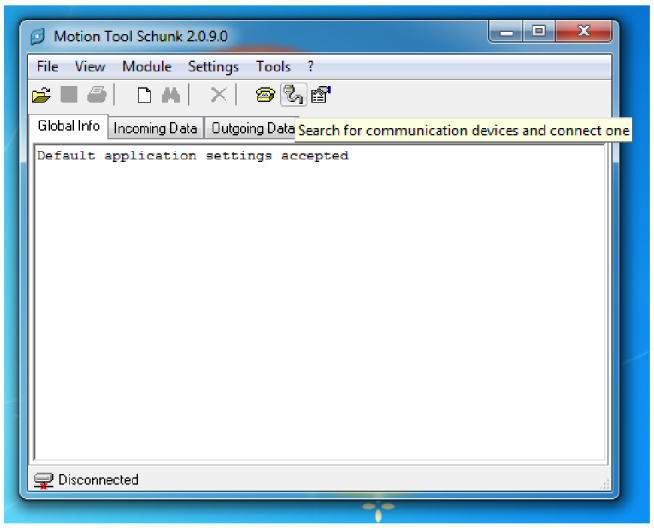
5.9.3 Opening Motion Tool SCHUNK (MTS)

Procedure for Windows 7

- The computer is connected to the product via USB Mini AB, Device

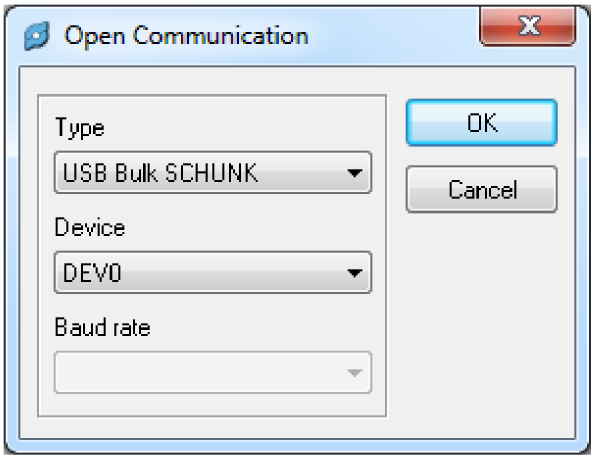


1. Open Motion Tool SCHUNK (MTS) via "mts.exe".



⇨ The program window is displayed.

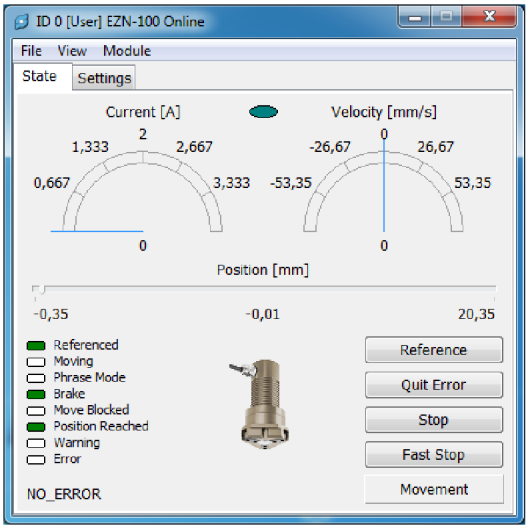
2. Go to "Settings" and choose "Open Communication..." from the menu.



⇨ The "Open Communication" window appears.

3. Choose the "USB Bulk SCHUNK" interface and click the "Select" button.

⇨ Communication is established.

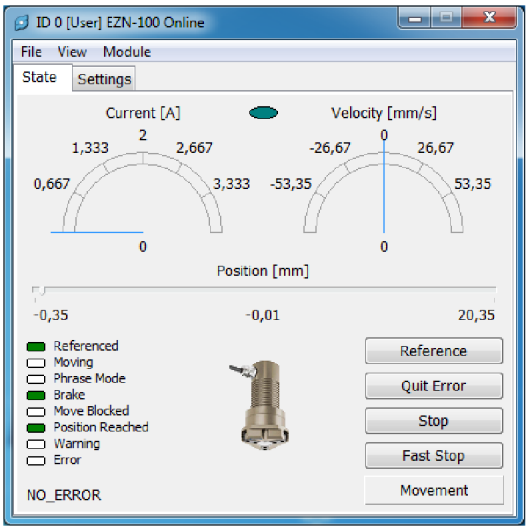


⇨ The module window is shown.

NOTE

In the module window, you can view the status of the module, change parameters, and test SCHUNK Motion Protocol (SMP) commands; see the "SCHUNK Motion Control" software manual.

5.9.4 Performing initial commissioning



Example of product window in Windows 7

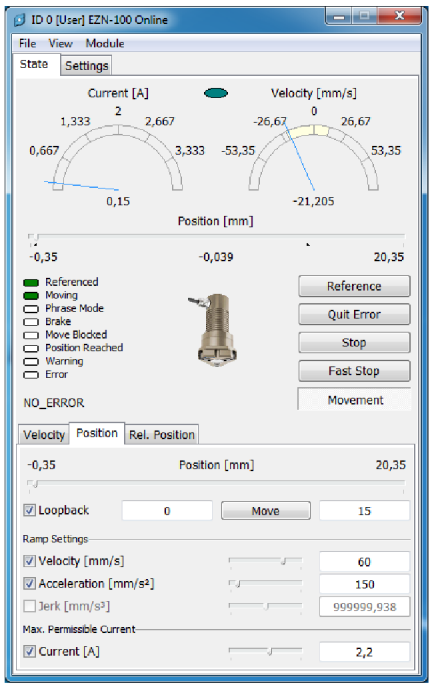
Initial commissioning of the product can be performed without any further parameterization.

The status of the product is displayed on the left side of the product window.

The most important SMP commands can be selected on the right side of the product window. All other possible SMP commands can be found under the "Module" menu option.

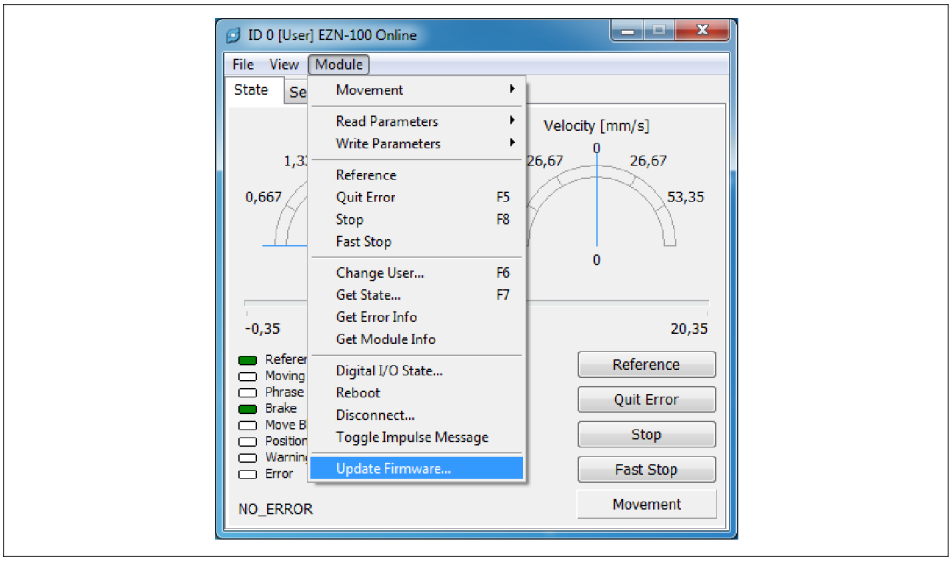
Procedure for Windows 7

1. Click the "Movement" button.



⇨ Additional control elements for motion commands are displayed.

2. Click the "Move" button.
   ⇨ The product moves in the defined cycle.



3. To test further SMP commands, choose the "Module" option.

5.10 Updating firmware

The Firmware can only be updated with the prior consent of the SCHUNK service department.

NOTE
The Firmware has the file extension *.bin.

The Firmware can be updated via the USB mini AB, device or the USB micro AB, host.

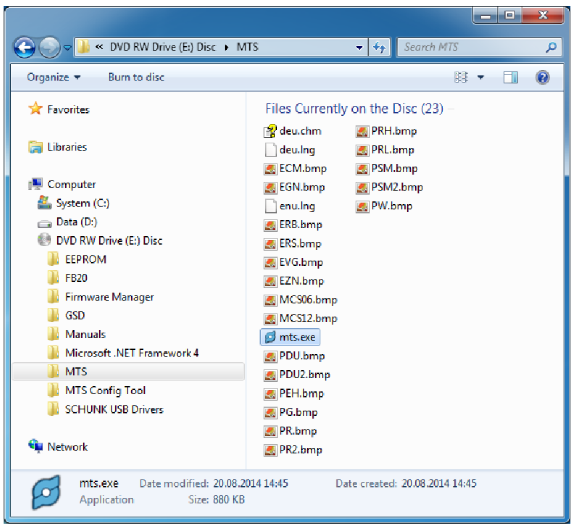
Via the USB mini AB, device, this is possible as follows:

- Firmware manager
  - All software versions
- Software "Motion Tool SCHUNK (MTS)"
  - up to and including software version 2.12

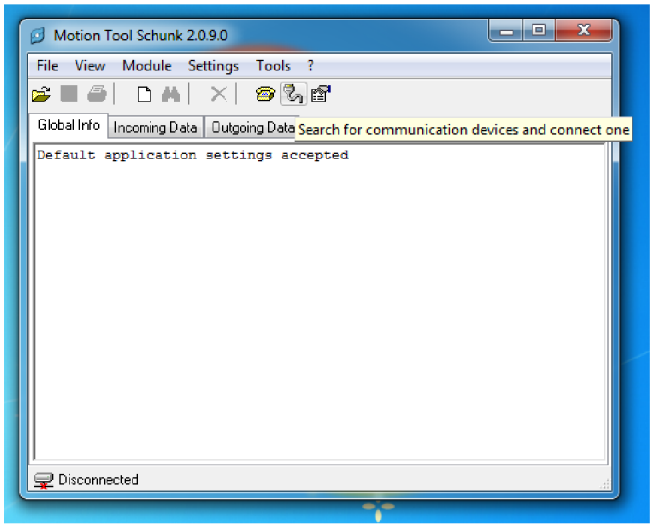
5.10.1 Update via USB Mini AB, Device

Procedure for Windows 7

- There is new firmware on the computer
- The power supply of the product is connected
- The computer is connected to the product via USB Mini AB, Device

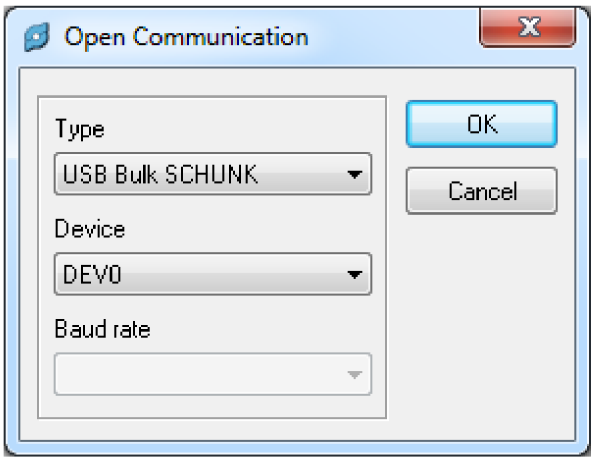


1. Start Motion Tool SCHUNK (MTS) using "mts.exe".



⇨ The program window is displayed.

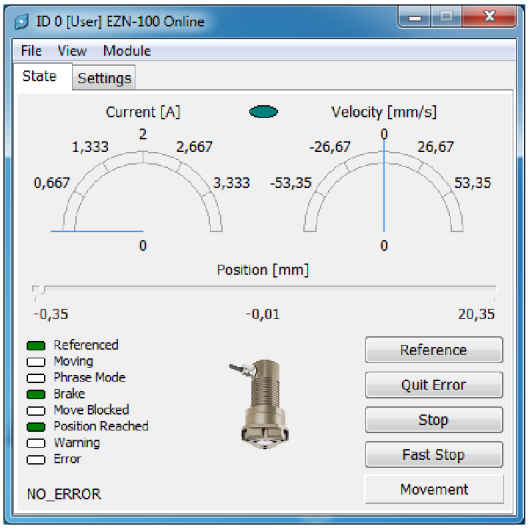
2. Go to "Settings" and choose "Open Communication..." from the menu.



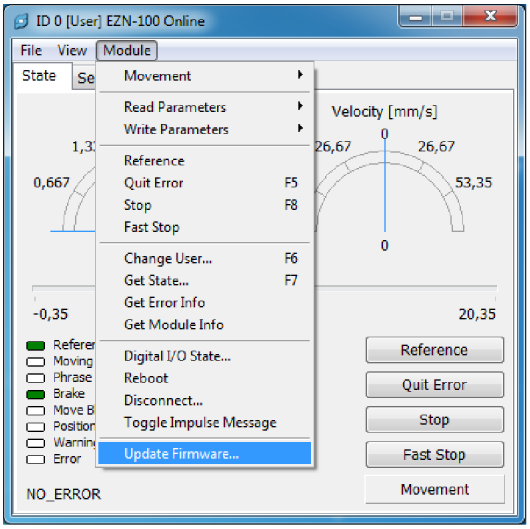
⇨ The "Open Communication" window appears.

3. Choose the "USB Bulk SCHUNK" interface and click the "Select" button.

⇨ Communication is established.



⇨ The product window is displayed.



4. Go to the "Module" menu and choose "Update firmware...".

⇨ The "Update firmware" window appears.

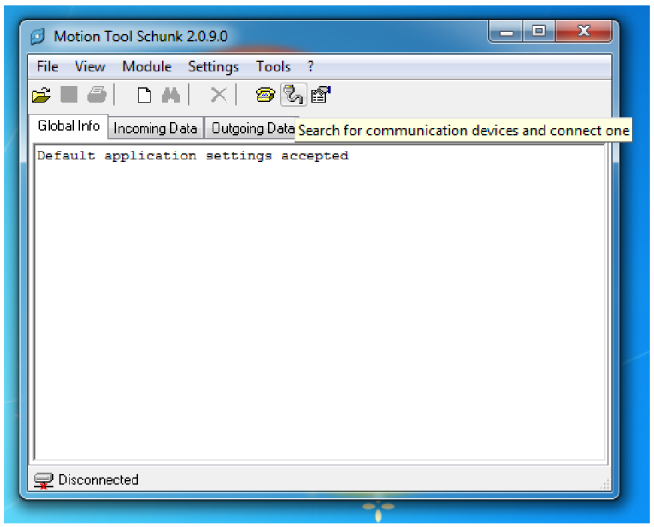
⇨ The "File selection" window appears.

5. Select "New firmware on the computer" and click the "Open" button.

⇨ The "File selection" window closes.

⇨ The "Password Entry" window appears.

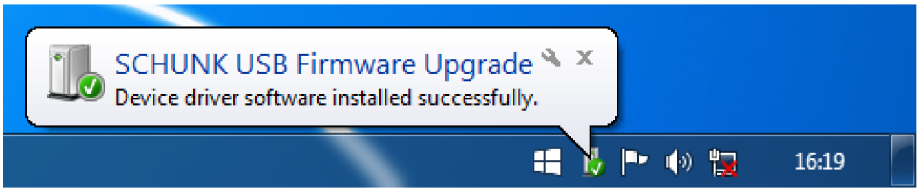
6. Enter your password and click the "OK" button.



⇨ The firmware update begins.

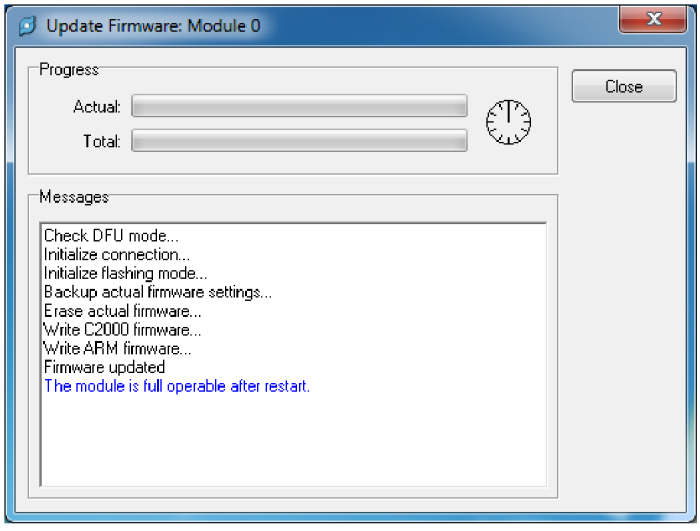
NOTE

Do not switch off the product during the update.



⇨ Windows may display a message during the update.

⇨ The progress of the update is displayed in the "Update firmware:" window.



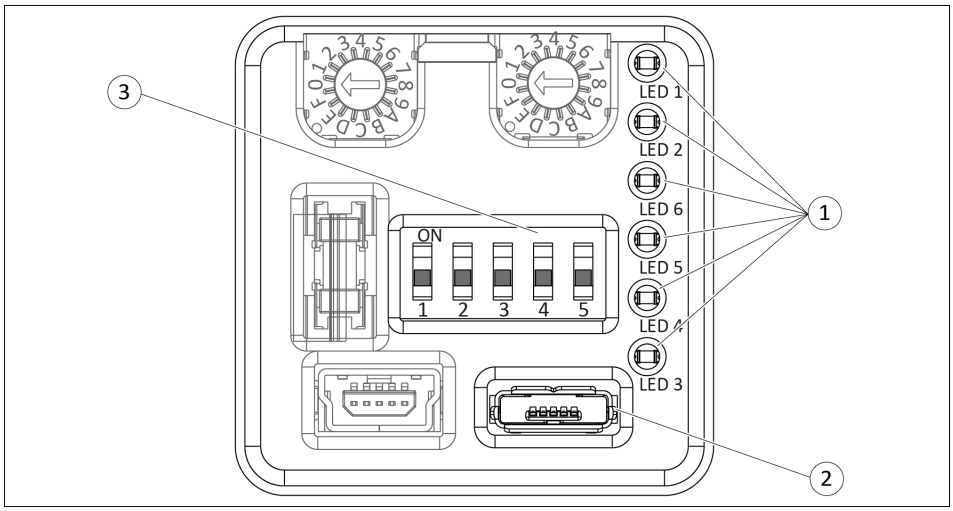
7. When the update is finished, the "Please restart the module" message appears in the "Update firmware:" window.
8. Disconnect the product from the power supply.

⇨ LED 1 and LED 2 go out.

⇨ LED 3 goes out.

9. Switch on the power supply of the product.
   ⇨ LED 1 and LED 2 light up green.
   ⇨ LED 3 lights up yellow.
10. Click the "Close" button.
    ⇨ The "Update firmware:" window closes.

5.10.2 Update via USB Micro AB (host)



Service window, PROFIBUS and CAN bus variant

1	LED
2	USB Micro AB, host
3	DIP switch

CAN bus communication interface

CAUTION

Risk of damaging the logic board!

If the product is disconnected from the power supply while the logic board is being updated, the software will not be completely installed and can no longer be started. The logic board update cannot be repeated.

- Do not disconnect the product from the power supply.
- If the product is disconnected from the power supply while the logic board is being updated, send the product to SCHUNK with a repair order.

- There is new firmware on the USB flash drive
- The power supply is disconnected from the product
- DIP switches "1" and "2" are in "OFF" position

1. Connect the USB flash drive to the USB Micro AB, host.
2. Switch on the power supply of the product.

- ⇨ LED 1 and LED 2 light up green.
- ⇨ LED 6 lights up green.
- ⇨ LED 4 lights up red for approx. 5 seconds.
- ⇨ After LED 4 goes out, LED 3 lights up yellow for approx. 5 seconds.
- ⇨ After LED 3 goes out, LED 4 lights up red.

3. Switch DIP switch "1" to "ON" position.
   - ⇨ LED 1 and LED 2 light up green.
   - ⇨ LED 6 lights up red.
   - ⇨ LED 3 lights up yellow.
   - ⇨ LED 4 flashes red once.
4. Switch DIP switch "2 "to "ON" position.
   - ⇨ LED 1 and LED 2 light up green.
   - ⇨ LED 6 lights up red.
   - ⇨ LED 3 lights up yellow.
   - ⇨ LED 4 flashes red once.

NOTE

The logic board is being updated.

- Do not disconnect the product from the power supply.

   - ⇨ LED 4 flashes red rapidly.
   - ⇨ LED 4 lights up red for approximately 10 seconds and goes out.
5. The adapter board update is finished.
6. Disconnect the product from the power supply.
7. Disconnect the USB flash drive from the USB Micro AB, host.
8. Switch DIP switches "1" and "2" to "OFF" position.
9. Switch on the power supply of the product.
   - ⇨ LED 1 and LED 2 light up green.
   - ⇨ LED 6 lights up green.
   - ⇨ LED 4 lights up red for approx. 5 seconds.
   - ⇨ After LED 4 goes out, LED 3 lights up yellow for approx. 5 seconds.
   - ⇨ After LED 3 goes out, LED 4 lights up red.

⇨ The firmware update was successful and the product is ready for use.

PROFIBUS communication interface

CAUTION

Risk of damaging the logic board!

If the product is disconnected from the power supply while the logic board is being updated, the software will not be completely installed and can no longer be started. The logic board update cannot be repeated.

- Do not disconnect the product from the power supply.
- If the product is disconnected from the power supply while the logic board is being updated, send the product to SCHUNK with a repair order.

- There is new firmware on the USB flash drive
- The power supply is disconnected from the product
- DIP switches "1" and "2" are in "OFF" position

1. Connect the USB flash drive to the USB Micro AB, host.
2. Switch on the power supply of the product.
   ⇨ LED 1 and LED 2 light up green.
   ⇨ LED 6 lights up red.
   ⇨ LED 4 lights up red for approx. 5 seconds.
   ⇨ After LED 4 goes out, LED 3 lights up yellow.
3. Switch DIP switch 1 to "ON" position.
   ⇨ LED 1 and LED 2 light up green.
   ⇨ LED 6 lights up red.
   ⇨ LED 3 lights up yellow.
   ⇨ LED 4 flashes red once.
4. Switch DIP switch 2 to "ON" position.
   ⇨ LED 1 and LED 2 light up green.
   ⇨ LED 6 lights up red.
   ⇨ LED 3 lights up yellow.
   ⇨ LED 4 flashes red once.

NOTE

The logic board is being updated.

- Do not disconnect the product from the power supply.

   ⇨ LED 4 flashes red.

NOTE

The adapter board is being updated.

- If the product is disconnected from the power supply while the adapter board is being updated, repeat the update process for the product.

⇨ LED 4 lights up red for approx. 5 seconds and goes out.

5. The adapter board update is finished.
6. Disconnect the product from the power supply.
7. Disconnect the USB flash drive from the USB Micro AB, host.
8. Switch DIP switches "1" and "2" to "OFF" position.
9. Switch on the power supply of the product.
   ⇨ LED 1 and LED 2 light up green.
   ⇨ LED 6 lights up red.
   ⇨ LED 3 lights up yellow for approx. 5 seconds.
   ⇨ After LED 3 goes out, LED 4 lights up red.

⇨ The firmware update was successful and the product is ready for use.

5.11 Systemintegration

5.11.1 Notes on the compatibility of Motion Tool Schunk (MTS) and firmware

The "Motion Tool SCHUNK (MTS)" configuration and commissioning tool and the firmware are coordinated with each other. Only the combinations of "MTS" and firmware version listed in the following table are compatible with each other. If other combinations are used, the product may end up in an undefined status during parameterization.

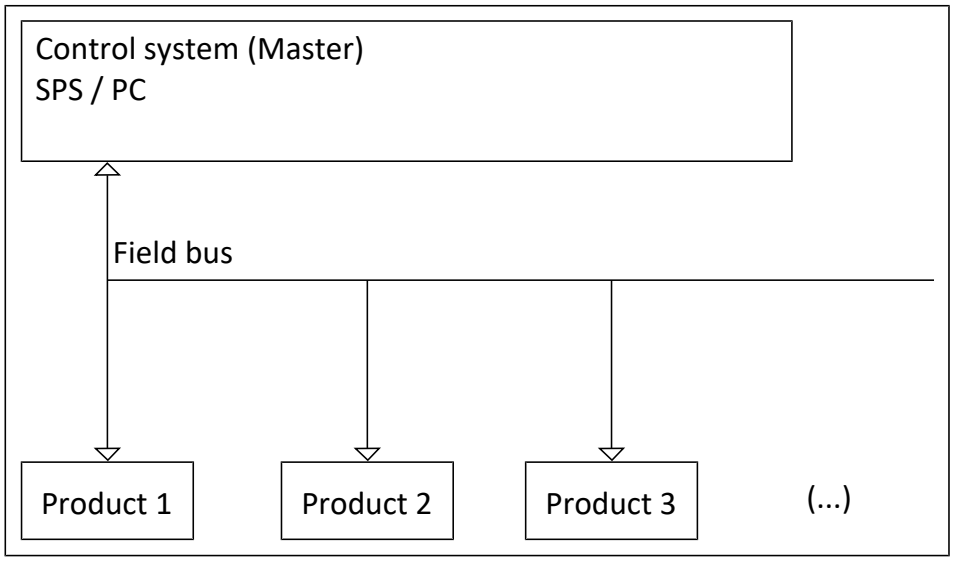
Compatibility of Firmware and Motion Tool SCHUNK (MTS)		
Firmware	2.x	3.x
MTS	2.x	2.x

The program version of the "Motion Tool SCHUNK (MTS)" is shown at the top of the program window.

The software version is displayed on the "General Information" tab under "Software Version".

The firmware version of the product can be found in the product window by choosing "Module" and then "Module Information".

5.11.2 System structure



System structure

Data format

The data is transferred in INTEL Format (Little Endian For-mat).

NOTE

The number of connected products depends on the used bus system. A maximum of 255 IDs can be assigned. For more information, see *Motion Control* document.

5.11.3 SCHUNK Motion protocol

Schunk Motion Protocol

The data frame of the Motion protocol always includes the following elements:

- D-Len (1 byte)
- Command code (1 byte)

D-Len (Data Length) specifies the number of subsequent items of user data including the command byte. The data frame consists of one byte, therefore a Motion protocol message can transfer a maximum of 255 data bytes.
The D-Len byte is always followed by the command code, consisting of one byte. If necessary, the command code is followed by the relevant parameters that are required. If required, a "master command" can be extended with a "sub-command".
All commands sent are immediately confirmed by the product

with a response (acknowledge). This response also uses the data frame described above (D-Len, command code, any parameters). If the request has been processed successfully, D-Len always has a value that is not equal to "0x02". If the request fails, D-Len will have the value "0x02".

NOTE
For specific features of the different bus systems, please consult the software manual *Motion control*.

5.11.4 Important commands

⚠ DANGER

Risk of injury by unexpected movements of the machine/ system!

When settings and parameter entries are faulty, components can move in an uncontrolled manner and cause serious injuries.

- Only specialists or specially trained personnel should carry out settings and enter parameters.

NOTE
In all examples only the required parameters are listed, not the optional ones. In the examples "M" stands for Master and "S" for Slave (= product).

NOTE
For further information on the commands, see Software Manual "SCHUNK Motion Protocol".

Reference run

Command code: 0x92

Description: Eine Referenzfahrt wird ausgeführt.

Parameter: (Master -> Slave): Keine.

Response (Slave -> Master): "OK" (0x4F4B) if successful. Product is executing the command.

Others: Spontaneous response is possible

	D-Len	Cmd	Param	Meaning
M -> S	0x01	0x92		
S -> M	0x03	0x92	0x4F0x4B	successfully referenced

Tab.: Example for REFERENCE

Positioning run

Command code: 0xB0

Description: Moves the product to a specified position.

Parameter (Master –> Slave):

- Position in configured unit system (must be specified)
- Velocity (optional)
- Acceleration (optional)
- Current (optional)
- Jerk (optional)

Response (Slave –> Master): If possible, the time that the module needs for the movement is returned.

Others: Spontaneous response occurs when position is reached or if positioning run is terminated earlier

	D-Len	Cmd	Param	Meaning
M –> S	0x05	0xB0	0x00 0x00 0x20 0x41	Move to position 10.0 [mm]
S –> M	0x05	0xB0	0xCD 0xCC 0x04 0x41	Will reach position in 8.3 [sec]

Tab.: Example for MOVE POS

Velocity run

Command Code: 0xB5

Description:A velocity run is executed.

Parameter (Master –> Slave)**:**

- Velocity in the configured unit system (must be specified)
- Current (optional)

Response (Slave –> Master)**:** "OK" (0x4F4B) if successful. Product executes the command.

Others: Spontaneous message is possible if the product is no longer moving.

	D-Len	Cmd	Param	Meaning
M –> S	0x05	0xB5	0x9A 0x99 0x31 0x41	Execute velocity run with 11.1 [mm/s]
S –> M	0x05	0xB5	0x4F 0x4B	

Tab.: Example for MOVE VEL

Stop the product

Command Code: 0x91

Description: Product braked and stopped in the current position.

Parameter (Master –> Slave)**:** None.

Response (Slave –> Master)**:** "OK" (0x4F4B) if successful.

Others: Spontaneous message is possible.

	D-Len	Cmd	Param	Meaning
M –> S	0x01	0x91		
S –> M	0x03	0xB5	0x4F 0x4B	OK

Tab.: Example for CMD STOP

Stop the product immediately

Command Code: 0x90

Description: Product is stopped as quickly as possible. If a brake is fitted and configured appropriately, it is activated immediately. The motor phases are short-circuited.

Parameter (Master -> Slave)**:** None.

Response (Slave -> Master)**:**Error message "ERROR EMERGENCY STOP" is triggered.

Others: Can only be reset by "CMD ACK."

	D-Len	Cmd	Param	Meaning
M -> S	0x01	0x90		
S -> M	0x03	0x88	0xD9	Emergency stop executed

Tab.: Example for EMERGENCY STOP

Achknowledge error

Command Code: 0x8B

Description: Achknowledgement of an error message.

Parameter (Master -> Slave)**:** None.

Response (Slave -> Master)**:** "OK" (0x4F4B)

Others: If all errors have been successfully acknowledged, an "INFO NO ERROR“ info message is sent after sending "OK“ (0x4F4B).

	D-Len	Cmd	Param	Meaning
M -> S	0x01	0x8B		
S -> M	0x03	0x8B	0x4F 0x4B	OK

Tab.: Example for CMD ACK

6 Start-up

NOTE

The transducer system integrated in the product acts as a pseudo absolute-value transducer in conjunction with the position maintenance brake. Therefore, under certain conditions, referencing may be omitted after a restart, provided that the base jaws can move freely and have not been moved manually before. To ensure a reliable process sequence, SCHUNK recommends carrying out a reference run after each system restart.

6.1 Systemintegration

For communication between PLC and product, SCHUNK provides the following two protocols:

- SCHUNK Drive Protocol (SDP)
  - Recommended for PROFIBUS by SCHUNK.
  - Not available with CAN bus.
- SCHUNK Motion Protocol (SMP)
  - Available for CAN bus and PROFIBUS.

6.1.1 SCHUNK Drive Protocol (SDP)

If products are connected to the PLC via PROFIBUS, the "SDP" protocol is available.

For more information, see software manual "SCHUNK Drive Protocol (SDP)".

6.1.2 SCHUNK Motion protocol (SMP)

If products are connected to the SPS via PROFIBUS or PROFINET, the "SMP" protocol is available.

For PROFIBUS, SCHUNK recommends using the "SDP" protocol.

For more information, see software manual "SCHUNK Motion Protocol (SMP)".

6.1.3 Notes on the compatibility of Motion Tool Schunk (MTS) and firmware

The "Motion Tool SCHUNK (MTS)" configuration and commissioning tool and the firmware are coordinated with each other. Only the combinations of "MTS" and firmware version listed in the following table are compatible with each other. If other combinations are used, the product may end up in an undefined status during parameterization.

Compatibility of Firmware and Motion Tool SCHUNK (MTS)

Firmware	2.x	3.x
MTS	2.x	2.x

The program version of the "Motion Tool SCHUNK (MTS)" is shown at the top of the program window.

The software version is displayed on the "General Information" tab under "Software Version".

The firmware version of the product can be found in the product window by choosing "Module" and then "Module Information".

7 Trouble shooting

Once an error with an error message is eliminated, this error message must be acknowledged, see the "SCHUNK Motion Protocol (SMP)" and "SCHUNK Drive Protocol (SDP)" software manuals. The error is indicated in the service window via LED 4, ▸ 4.3.1 [🗋 25].

A list of the information and error codes can be found in the "SCHUNK Motion Protocol (SMP)" and "SCHUNK Drive Protocol (SDP)" software modules.
Detailed error information can be read out via "Motion Tool SCHUNK (MTS)"; see the "SCHUNK Motion Control (SMP)" software manual.

7.1 Communication malfunction

Possible cause	Corrective action
Logic supply fuse triggered	Check logic supply fuse and replace if necessary.
Connection between the product and "Motion Tool SCHUNK (MTS)" was interrupted	Check bus cable or USB cable for damage and replace if necessary.
No communication can be established with "Motion Tool SCHUNK (MTS)" (USB, PROFIBUS or CAN bus interface)	Check delivery state. Note: the product is supplied either with CAN or with PROFIBUS.
	Check the communication interface.
	Check end terminals. Is the product an end node in the bus? Is the termination resistor connected?
	For product with CAN bus
	Configure the CAN bus address, ▸ 5.7 [🗋 37].
	Check the baud rate, ▸ 5.6 [🗋 36].
	For product with PROFIBUS
	Check GSD file, use suitable GSD file if necessary.
	Configure PROFIBUS address, ▸ 5.7 [🗋 37].
	Check baud rate (1.5 or 12 mbaud).
Values are saved in EEPROM but not activated	Restart product after saving. OR: Before saving, stop the product using fast stop. **IMPORTANT! New values are not saved in EEPROM if the product is under control or in motion.**

7.2 Product moves in a jerky fashion, is sluggish or blocked

Possible cause	Corrective action
Product is overloaded	Check load situation, e.g. maximum permissible finger weight, maximum permissible finger length, load data of the base jaws.
	Check product, contact SCHUNK Service if necessary.
Voltage supply malfunction	Check the power output of the power supply unit.
	Check power cable line and cable cross sections (high loss of voltage possible with 24 VDC power supply).
	Check power cable line for shorts and cable breakage.
Sporadic breaks in communication	Check bus connection. ▶ 5.2 [🗋 29]
Dirt deposits on product (increasing sluggishness)	Clean product. ▶ 8.1 [🗋 62]
Moisture in the product (oil, cutting fluid, cleaning agent)	Clean product. ▶ 8.1 [🗋 62]
	Check for appropriate IP class.
Mechanical defect	Check product and replace if necessary.

7.3 Drive not turning

Possible cause	Corrective action
No voltage connected. (emergency stop chain interrupted, safety light curtain triggered)	Check the power supply requirement, ▶ 3 [🗋 20].
Insufficient voltage.	
Power supply fuse triggered	Check power supply fuse and replace if necessary.
Error message pending	Eliminate errors and acknowledge error message, see the "SCHUNK Motion Protocol (SMP)" and "SCHUNK Drive Protocol (SDP)" software manuals.
Setpoint settings for current, speed, jerk and acceleration are not suitable or too low	Check setpoint settings and enter suitable values, see the "SCHUNK Motion Protocol (SMP)" and "SCHUNK Drive Protocol (SDP)" software manuals.

8 Maintenance

8.1 Maintenance intervals

Interval [Mio. cycles] for EGL	Maintenance work
2	• Clean the product dry. (The product corresponds to the protection type IP 46). Remove all coarse dirt and chips from the cavities in the product. • Inspect the product for damage. Replace the product if necessary. Have all repair work on the product carried out only by SCHUNK.
As required	Update firmware, ▶ 5.10 [🗋 46].

8.2 Disassembly and assembling

This product must not be disassembled for maintenance.

CAUTION

Material damage due to improper disassembly!

Incorrect works can cause damage to the mechanics and internal electronics.

- Disassembly or opening of the product is not permitted.
- Only allow SCHUNK to repair the product.

9 EU-Declaration of Conformity

Manufacturer/ Distributor	SCHUNK SE & Co. KG Spanntechnik | Greiftechnik | Automatisierungstechnik Bahnhofstr. 106 – 134 D-74348 Lauffen/Neckar
Product designation:	2-finger parallel gripper / EGL /electric
ID number	1308007, 1308008

We hereby declare on our sole authority that the product meets the requirements of the following directives at the time of the declaration.
The declaration is rendered invalid if modifications are made to the product.

- **EMC Directive 2014/30/EU**
  Directive of the European Parliament and the Council of February 26, 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility

Applied harmonized standards, especially:

EN IEC 61000-6-2:2019	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments
EN IEC 61000-6-4:2019	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments

Signed for and on behalf of: SCHUNK SE & Co. KG

Signature: see original declaration

Lauffen/Neckar, December 2024

Dr.-Ing. Manuel Baumeister,
Head of Systems Engineering,
Technology & Innovation

10 Translation of the original declaration of incorporation

in terms of the Directive 2006/42/EG, Annex II, Part 1 Section B.

Manufacturer/ Distributor	SCHUNK SE & Co. KG Spanntechnik | Greiftechnik | Automatisierungstechnik Bahnhofstr. 106 – 134 D–74348 Lauffen/Neckar

We hereby declare that the partly completed machine described below

Product designation:	2–finger parallel gripper / EGL /electric
ID number	1308007, 1308008

meets the following basic occupational health and safety of the Machinery Directive 2006/42/EC:

No. 1.1.1, No. 1.1.2, No. 1.1.3, No. 1.1.5, No. 1.3.2, No. 1.5.1, No. 1.5.2; No. 1.5.4, No. 1.5.6, No. 1.5.8, No. 1.5.10, No. 1.5.11, No. 1.5.13

The partly completed machinery may not be put into operation until it has been confirmed that the machine into which the partly completed machinery is to be installed complies with the provisions of the Machinery Directive (2006/42/EC). The declaration shall be rendered invalid if modifications are made to the product.

Applied harmonized standards, especially:

EN ISO 12100:2010	Safety of machinery – General principles for design – Risk assessment and risk reduction

The special technical documentation according to Annex VII, Part B, belonging to the partly completed machine, has been created.

Person authorized to compile the technical documentation:
Stefanie Walter, Address: see manufacturer's address

Signature: see original declaration

Lauffen/Neckar, December 2024

Dr.–Ing. Manuel Baumeister,
Head of Systems Engineering,
Technology & Innovation

11 UKCA declaration of Conformity

Manufacturer/ Distributor	SCHUNK Intec Limited Clamping and gripping technology 3 Drakes Mews, Crownhill MK8 0ER Milton Keynes

We hereby declare on our sole authority that the product meets the requirements of the following directives at the time of the declaration.
The declaration is rendered invalid if modifications are made to the product.

Product designation:	2-finger parallel gripper EGL
ID number	1308007, 1308008

- **Electromagnetic Compatibility Regulations 2016**

Applied harmonized standards, especially:

EN IEC 61000-6-2:2019	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments
EN IEC 61000-6-4:2019	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

Person authorized to compile the technical documentation:
Marcel Machado, address: refer to manufacturer's address

Signed for and on behalf of: SCHUNK SE & Co. KG

Lauffen/Neckar, December 2024

Dr.-Ing. Manuel Baumeister, Head of Systems Engineering, Technology & Innovation

12 UKCA declaration of incorporation

in accordance with the Supply of Machinery (Safety) Regulations 2008.

Manufacturer/ Distributor	SCHUNK Intec Limited Clamping and gripping technology 3 Drakes Mews, Crownhill MK8 0ER Milton Keynes

We hereby declare that on the date of the declaration the following partly completed machine complied with all basic safety and health regulations found in the
"Supply of Machinery (Safety) Regulations 2008".
The declaration shall be rendered invalid if modifications are made to the product.

Product designation:	2-finger parallel gripper / EGL / electric
ID number	1308007, 1308008

The partly completed machine may not be put into operation until it has been confirmed that the machine into which the partly completed machine is to be installed complies with the provisions of the "Supply of Machinery (Safety) Regulations 2008".

Applied harmonized standards, especially:

EN ISO 12100:2010	Safety of machinery – General principles for design – Risk assessment and risk reduction

The special technical documentation according to Annex VII, Part B, belonging to the partly completed machine, has been created.

Person authorized to compile the technical documentation:
Marcel Machado, address: refer to manufacturer's address

Lauffen/Neckar, December 2024

Dr.-Ing. Manuel Baumeister,
Head of Systems Engineering,
Technology & Innovation

13 Information on the RoHS Directive, REACH Regulation and Substances of Very High Concern (SVHC)

RoHS Directive

SCHUNK products are classified as "large-scale stationary installations" or as "large-scale stationary industrial tools" within the meaning of Directive 2011/65/EU and its extension 2015/863/EU "on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)", or fulfill their intended function only as part of one. Therefore products from SCHUNK do not fall within the scope of the directive at this time.

REACH Regulation

Products from SCHUNK fully comply with the regulations of Regulation (EC) No. 1907/2006 "concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)" and its amendment 2022/477. SCHUNK attaches great importance to completely avoiding chemicals of concern to humans and the environment wherever possible.

Only in rare exceptional cases do SCHUNK products contain SVHC substances on the candidate list with a mass content above 0.1%. In accordance with Article. 33 (1) of Regulation (EC) No. 1907/2006, SCHUNK complies with its duty to "communicate information on substances in articles" and lists the components concerned and the substances used in an overview that can be viewed at **schunk.com\SVHC**.

Signature: see original declaration

Lauffen/Neckar, December 2024

Dr.-Ing. Manuel Baumeister,
Head of Systems Engineering,
Technology & Innovation

SCHUNK SE & Co. KG
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